SCHUYLKILL CANAL

by

E.F.Smith, A.A.Hesser, H.C.Wilson,
and others

Schuylkill County Historical Society, etc.
Pottsville, etc.

CONTENTS:

Schuylkill Navigation	Edwin F. Smith
Schuylkill Canal part II	A.A. Hesser
Schuylkill Canal part III	H. C. Wilson

98280

974.8

The Schuylkill Navigation.

By EDWIN F. SMITH, General Manager.*

At an early day in the history of Pennsylvania, the improvement of its waterway, as a means of transportation, claimed the attention of men prominent in affairs of state.

William Penn, in the year 1690, in a paper writing in reference to transportation routes, called attention to the feasibility of a passage by water between the Susquehanna river and the Tulpehocken creek, a branch of the Schuylkill.

As early as 1762, David Rittenhouse, the celebrated astronomer, and about the same time, Dr. William Smith, Provost of the University of Pennsylvania, surveyed and examined a route for a canal, to connect the waters of the Susquehanna and the Schuylkill rivers, by way of the Swatara creek, a branch of the Susquehanna, and the Tulpehocken, a branch of the Schuylkill. This project was in that day referred to by residents of Philadelphia as—"A part of something greater," a "preliminary step to something further."

These gentlemen at that early day were looking forward to a great line of intercommunication between the rivers of eastern Pennsylvania and the waters of Lake Erie. Such a line was actually traced by them, five hundred and eighty-two miles long, between the Delaware river and the Ohio at Fort Pitt (Pittsburgh), and thence to the lake at Presque Isle (Erie).

They did not propose a continuous navigation, but instead, judicious improvements along water courses by means of locks, dams and wiers, with here and there a

*This paper was prepared at the suggestion of Mr. A. A. Hesser, who read it before the Society, March 28, 1906.

short canal, etc., and a "good turnpike across the Allegheny Mountains."

In the years 1791 and 1792, two companies were chartered, one to open a canal between the waters of the Susquehanna and the Schuylkill rivers, and the other a similar work between the Schuylkill and Delaware rivers. These two companies subsequently consolidated under the name of the Union Canal, which, in addition to being a canal for traffic, was designed for a water supply for the city of Philadelphia.

The Act "to authorize the Governor to incorporate a Company to make a lock navigation on the river Schuylkill" was approved the eighth day of March, A. D. 1815, and the corporation was created under the "name, style and title of The President, Managers and Company of the Schuylkill Navigation Company."

The work of construction was probably begun late in the year 1816, and more or less work on the upper and lower sections of the river had been done before the close of the year 1818. The act of incorporation, unfortunately, provided that in making its improvements:

"The Company shall divide the river into two sections, the first extending from Lancaster Schuylkill Bridge, (now Callowhill Street, Philadelphia) to the Borough of Reading, and the second from the Borough of Reading to the mouth of Mill Creek; and shall commence their improvements of the first section at or near the lower falls in the County of Philadelphia, and at the same time shall commence their improvements of the second section at or near the Borough of Reading, and shall proceed upward in each section with the improvements; and it shall not be lawful to demand toll from any person for the passage of any boat or other craft through a lock or locks in the first section until a lock or locks be completed within the second section, and so to progress with similar improvements in each section until both are finished."

The charter limit of the work was from Mill Creek, two miles above Pottsville, to the Lancaster Street Bridge, (now Callowhill Street) at Fairmount. The distance was

108.23 miles, and the entire lockage from the established level of Dam No. 1 at Port Carbon to mean-tide at Philadelphia, 618.76 feet.

The Schuylkill Navigation is what is known as a slack-water navigation, being partly pool and partly canal. The length of the slack-water formed by dams in the river was 50.50 miles, and the length of the canals aggregated 57.73 miles.

The original works were designed for light draught and small tonnage boats, mostly 23 tons capacity, 75 feet long and 8 feet wide, designed to pass in pairs locks 17 feet wide.

The dams were necessarily small and cheaply built of wooden crib works. The only traffic anticipated was lumber and agricultural products, and a small coal tonnage descending the river, and return cargoes of merchandise from Philadelphia to the up river towns and settlements.

After the charter was obtained the season was too far advanced and the undertaking too imperfectly understood to render it advisable to begin the construction of works on the river. The Board of Managers, however, took measures to gain all the information possible in regard to any other works of a similar character that had been constructed in this country. The Erie Canal was not yet in existence, nor were there any others finished or in use that could be referred to.

Attention was called, however, to the improvement of the Connecticut river in Massachusetts, which had been effected by dams and canals, and a committee was sent there in the year 1815 to make inquiry concerning that work.

At Springfield they were introduced to Ariel Cooley, of that city, who had been the principal engineer on the improvements, and who, at the time, was engaged in erecting and completing some of the dams and locks on the Connecticut river, and also in constructing locks near the Falls of the James River at Richmond, Virginia.

Mr. Cooley received the committee at his residence and took pains to explain to them fully the nature of the improvements in the navigation that had been made. He

also went with them over a portion of the works, extending for several miles above Springfield, on which there were dams and locks. One dam in particular at Holyoke, Mass., a great work at that early day, was 1,040 feet long, 25 to 35 feet high from its foundation, and was constructed entirely of timber, bolted together with iron bolts, and fastened with iron to the rocky bed of the river. It was planked on the up stream slope and, unlike the timber dams of the present day, had but little stone filling. At that time it had been in use, withstanding the freshets of the Connecticut river for a period of twelve years, and under the advice of Mr. Cooley was taken as the pattern for the dams about to be built on the Schuylkill river.

It may be of interest, as illustrating the discouragements encountered by managers of public works at that time, the difficulty of procuring sufficient money and even skillful men to carry on the work, to quote from the first report of Cadwalader Evans, Jr., presented to the Stockholders of the Schuylkill Navigation Company on December 1st, 1820. Mr. Evans says:

"In pursuance of the Act of Incorporation, there have been completed in the upper section of the river Schuylkill, which commences at the mouth of Mill Creek in Schuylkill County, and ends at Reading, fifteen dams, fourteen canals, and forty-six locks. With the exception of a tunnel, a short canal and three locks, which are under contract to be finished early in the spring, the navigation is completed from the vicinity of the coal mines to Kern's Mill, about one mile from Hamburg, making in that section a distance of about twenty-five miles, and overcoming a fall of about two hundred and fifty feet.

In the lower section, which commences at the Lancaster Schuylkill bridge, near Philadelphia, and extends to Reading, they have erected eight dams, four canals, and twenty-one locks, overcoming a fall of eighty-eight feet, making in the whole, twenty-three dams, eighteen canals, and sixty-seven locks, thereby rendering navigable about fifty-four miles, including twelve miles of excavation for the canals; overcoming a fall of about three hundred and forty feet, comprising all the most difficult parts of the

river, and leaving to be improved about two hundred feet of fall, exclusive of the natural descent necessary for the discharge of the water.

In the progress of this arduous and novel undertaking, the managers have had great obstacles to encounter.

First. In procuring skilful persons to execute the work, and second, by the simultaneous construction of the works on both sections of the river, as enjoined by the Act of Incorporation.

In conforming to the will of the Legislature in the latter respect, great difficulty and loss has been experienced from the want of proper superintendence, which it was impossible to give at the same time, at points so remote from each other. To this cause is to be attributed, in a great degree, the failure of part of the works performed by contract.

The causes which thus embarrassed the managers have at length yielded to their perseverance; the works are now brought within more confined limits, and the experience which has been acquired, and the skill of the engineers now employed, leave no ground to apprehend further difficulties on that account."

At this time, to December, 1820, it was recognized that the anthracite coal trade would grow to large proportions, and that it would yield a considerable revenue to the canal.

Mr. Evans goes on to say in the same report:

"The importance of the work appears to increase as it approaches to completion. Abundant mines of coal, beds of iron ore, of limestone and marble, which for the want of navigation have remained inert, are continually developed and promise to add considerably to the wealth and resources of the state."

Mr. Evans refers to the great demand for coal already existing and to the fact that if the canal were completed throughout:

"From the city of Philadelphia to John Potts' Forge, near the coal mines in Schuylkill County, immediate sales to a great extent could no doubt be made. That this opinion is well-founded must appear from the extraordinary

fact, and which has never yet been known to be the case with respect to any other species of fuel, that wagons are now employed to transport this coal from the mines to a distance of from eighty to ninety miles, and large quantities are now brought by wagons and consumed in this city."

During the year 1821 there was completed on the upper section of the river, the tunnel and the canals and locks under construction the year previous, "so that the navigation as stated in the report for that year is now complete from John Potts', at the coal mines, to within half a mile of Hamburg, below the mountain, and within sixteen miles of Reading. Thus far the navigation is complete, and boats have during the last fall (1821) been engaged in transporting the produce of the upper country, and large quantities of coal from the mines to the neighborhood of Hamburg, where it has been deposited and the coal sold out from the yards at that place to the country people in its neighborhood, and for many miles distant. The Board of Managers did not require any toll from the boats navigating this section of the river, believing that true policy dictated every encouragement to experiments upon this novel kind of navigation."

Below Reading, the work done up to the close of the year 1821, embraced the whole extent of the river from Fairmount to the lower line of the borough of Reading. There remained to be done the section between Reading and Hamburg, a distance of about sixteen (16) miles, "to complete and render perfect the navigation from the city of Philadelphia to the coal mines in Schuylkill County."

About this time, also, the managers of the company were giving attention to the development of the water power of the lower river, more particularly at Manayunk and Conshohocken. The first grant of power was made at the former place on the 10th of April, 1819, and was followed during the years 1821-22 by extensive grants of power, on the Manayunk Canal, all of which are still in use, in mills for the manufacture of paper, and in cotton and woolen mills. The town of Manayunk, now the 21st ward of the city of Philadelphia, was laid out by the Schuylkill

Navigation Company, and it was the expectation of the management that it would prove a source of great emolument independent of the whole water power.

The report of January 7th, 1822, goes on to say:

"The daily experiments which are making for the introduction of anthracite fuel into the houses of our citizens; its applicability to all purposes of manufacture, and the extensive purchase which has been made by a number of respectable citizens of New York of coal lands at the head of the Schuylkill, for the purpose of establishing a coal company for the supply of that city, fully warrants the belief that to meet the demand which both objects will create, will require all the industry of those who may be engaged in the transportation on the river, and must necessarily give the company, from this source alone, an ample remuneration for the cost of the work, while it may be remarked that little doubt can exist but that the rent of water power and the transportation of the trade of the river, independently of the coal, will yield at least six per cent. on the capital invested by the stockholders."

How well this expectation was borne out is illustrated by the fact that about ten years thereafter the Navigation Company earned and divided among its stockholders, dividends at the rate of six per cent. quarterly, or twenty-four per cent. per annum, and had still remaining a large surplus of money, which it expended on building monumental cut stone locks, and permanent abutments for some of the dams on the river, which to this day remain as monuments of the skill of the builders.

In the report of Jospeh S. Lewis, dated 2nd of January, 1826, the President and Managers report:

"That after innumerable difficulties, and vexatious delays, they now have the pleasure to say that the great work entrusted to their care is nearly brought to a happy conclusion, and that the time has arrived when there is every prospect of remuneration to the Stockholders for their advances, and for their zealous and cordial support of the Board in this arduous and important undertaking."

It was during the year 1825 that the Navigation was

first put into use throughout, from Philadelphia to Mt. Carbon, and the report for that year is a record of vexatious delays in completing the work and of much trouble in maintaining the Navigation throughout, on account of the frequent occurrence of leaks in those parts of the canal which passed over limestone formations.

The report also refers to:

"The lamented decease of their engineer, Thomas Oakes, (whose merit deserves their most respectful commemoration) followed almost immediately by that of another engineer, Mr. King, interposed obstacles in the way of the prosecution of the work not easily surmounted, nor without much delay."

Although the early reports of the Navigation Company make no mention of the fact, it is evident that Thomas Oakes was the chief engineer of the company, on whom was laid the duty of locating and constructing the line throughout, from Philadelphia to Mt. Carbon. The Oakes Canal, opposite Phoenixville, bears his name.

The works, as has been stated before, were in extent about one hundred and eight miles, of which sixty-two miles were by canal and forty-six miles by pools in the river. The number of locks below Reading was thirty-nine and above Reading, eighty-one, being in all one hundred and twenty, of which twenty-eight were guard locks, overcoming a fall of five hundred and eighty-eight feet.

To this report of January 2nd, 1826, is appended a statement of receipts and expenditures, from the commencement of the works to the 1st of January, 1826, showing that the amount of money received from subscribers and from tolls, rents, loan and interest, and also from the city of Philadelphia, for removing the restriction on the surplus water of Fairmount, was $1,951,483.89, and the amount paid for the improvements on the river and the construction of locks, canals and dams, was $1,949,816.47, leaving a balance on hand, January 1, 1826, of $1,667.42. The amount of tolls and rents received by the company during the same period was $34,129.00, included in which is the amount of toll received during the year 1818 on

some one section of the river, on which the improvements had been finished, amounting to $248.00.

In the early days of the navigation of the Schuylkill river, lumber from the upper country was usually run by way of the river in rafts and floats.

The first locks of the Schuylkill Navigation were built of the size eighty feet long by seventeen feet wide, and were planned for arks and rafts. After a few years, when the anthracite coal trade increased in volume, an erroneous notion prevailed that there would not be water enough in the river to supply locks of the size, eighty feet long by seventeen feet wide, and an application was made to the Legislature of Pennsylvania for permission to reduce the size to thirteen and one-half feet in width, and many locks were so built, although in later years it was recognized that a mistake had been made.

The early navigation was for boats carrying only eighteen tons. About the year 1829 the canal had been deepened so that boats were enabled to carry about twenty-three tons. Following this, about the years 1833 to 1835, the depth of water in the dams and canals was increased from forty inches to forty-eight inches, or four feet, and the boats were increased from a width of nine feet to thirteen feet, so that their carrying capacity was about forty tons. The locks were doubled in pairs, being placed side by side, throughout the Navigation, and in that way the capacity of the works were very much increased.

During the year 1828 the Navigation was extended from Pottsville to the mouth of Mill Creek (Port Carbon), by George Duncan, an engineer and contractor of great ability. He built the original canal below Leesport, known as the "Duncan Canal," three miles in length, involving heavy rock cutting and other extraordinary work.

In addition to the dams and locks between Mt. Carbon and the head of the Navigation at Port Carbon, two miles above "Potts' Forge" (now Pottsville), he was the engineer of and planned and constructed the canal tunnel near Auburn. This was the FIRST TUNNEL IN THE UNITED STATES. It was a great curiosity, and people

came from as far as Philadelphia to see it. It was originally about four hundred feet long, but was shortened from time to time until about the year 1857, when it was reduced to an open cutting. Three brothers—Job, Samson and Solomon Fudge—were the contractors. This tunnel was constructed through a low hill, or spur of the hill, which might easily have been avoided by laying out the canal line about one hundred feet westward, on the location afterwards occupied by the Reading Railroad, but the people interested in the Navigation Company wanted a tunnel, knowing that it would be the first one in the United States.

The Union Canal, connecting the Schuylkill Canal with the Susquehanna river, was completed and put into use during the year 1827, and toll was received by the Schuylkill Navigation Company upon about one thousand tons of freight from that source during the year. The trade from the Union Canal continued to grow and was a source of large revenue to the Schuylkill Navigation Company; so that at the close of the year 1828 the management looked forward to making some return to the stockholders in the way of dividends for their "long continued patience and perseverance."

It was during the year 1830 that an examination was made in order to ascertain another route which woud permit of abandoning the canal through the city of Reading, and for some six miles northward, where there had been continual interruptions and delays, caused by the nature of the limestone formation. For this purpose Judge Wright, an eminent engineer of that day, was chosen to examine into the matter in company with Edward H. Gill, engineer of the Navigation Company.

These examinations extended over a period of two years and led to the building of the present dams in the river from Reading to a point nine miles northward, forming a slackwater navigation which has been perhaps the least expensive and the most serviceable of all the works of the Schuylkill for a period of seventy years past. The works were admirably laid out by Edward H. Gill, and the

construction was carried on under the superintendence of George Duncan. It was completed and ready for trade at the opening of navigation in 1833.

In completing these works George Duncan showed great skill, particularly in the building of the timber dams of the river, at least two of which are still in use. For his day George Duncan was not only a great builder and contractor, but was a competent engineer as well, being able to design as well as construct.

In the making of the slackwater navigation, five miles in length, at Reading, to take the place of the leaky canal through the limestone formation, Mr. Duncan built three dams, eight locks, and a connecting canal one mile in length. These new works were opened for navigation on the 14th of June, 1833.

George Duncan began the construction of and nearly completed the first or Lower Tumbling Run Reservoir at Mount Carbon, but owing to some misunderstanding in reference to the work he resigned and left the company's service late in the year 1833.

As these reservoirs in the Tumbling Run Valley have always been an important adjunct of the Schuylkill Navigation, it may be well to say that upon the resignation of George Duncan the work was turned over to Edward H. Gill, civil engineer, in the company's service. He completed the lower reservoir and it was put into use for supplying the Navigation early in the year 1834. It has a depth of forty-one feet and holds 180,000,000 gallons of water. Mr. Gill also planned and laid out the second or Upper Tumbling Run Reservoir in the year 1834, with a depth of fifty-three feet and a capacity of 225,000,000 gallons of water. The work of construction was commenced in 1835 and the reservoir finished in a most substantial manner in the year 1836. It was put into use in the fall of that year.

Many able men were engaged upon the construction of the Navigation works during these years, notably during the several enlargements of the canal, extending over the period from 1830 to 1841.

Thomas Oakes was an engineer and millwright, of considerable reputation. He built the "Girard Canal," twenty-two miles long, in five levels, from Lewis' dam, below Reading, to what is now known at Parker Ford, formerly Lawrenceville. He also built the feeder dam and the canal, called by his name—the Oakes Canal—opposite Phoenixville.

Among these early canal builders may be mentioned Ariel Cooley, who built the Fairmount dam and the water power canal at Manayunk. Mr. Coole at that time said he thought in the future a dam at Flat Rock would be the right location from which to draw a supply of water for the city of Philadelphia, instead of pumping by steam from the river at Market Street, Philadelphia, as was then being done in the year 1816.

Henry and Peter Rankin, Scotchmen, were prominent stonemasons and builders of that time. They constructed a number of locks and abutments of dams and other structures of first-class cut stone masonry laid in cement, many of which are in use at this day.

These men are mentioned by Joseph S. Lewis, President, in his report for the year 1830, as the builders of the cut stone locks at Flat Rock, which were completed in September of that year, and were described as a very handsome specimen of work and did much credit to the builders, Messrs. Henry and Peter Rankin. The same may be said of all their other work on the Schuylkill Navigation, and there are no better specimens of cut stone masonry to-day in the State of Pennsylvania than the abutments of dams and the lock chambers built by these men.

The Schuylkill Navigation Company at that time had its own mills for the manufacture of hydraulic cement, at a location about two miles above the city of Reading. This is worthy of mention because it is evidently one of the two first hydraulic cement works in the United States. The other, as near as the writer can ascertain, having been located at the same time near Rondout, New York.

Another of the early builders was Michael Tower, who constructed portions of the work, including the Norris-

town dam, the Vincent dam, and part, if not all, of the Vincent Canal, four miles in length. He was a man of ability in the handling of public works, and left his mark upon everything he undertook. He also built the second Flat Rock Dam at a later date. Showing how well this work was done, it may be mentioned that a large part of it was in existence in the year 1904, when it was replaced by a new structure. The eastern and western abutments, however, show no signs of deterioration.

Louis Wernwag was connected with the works on the lower end of the river, near Philadelphia, but the writer is unable to say just what part of it was constructed by him. He was a builder of great reputation, his specialty being bridge building, of which, at that time, he had constructed some notable examples.

In the year 1812, he built the upper ferry or original Callowhill Street Bridge, of one span, three hundred and forty feet. This bridge was designed by Robert Mills, and was destroyed by fire in 1839.

Samuel Griscom, from an early period of the Navigation to the year 1848, was the general superintendent, and several dams, notably the present dam at Catfish (now Port Kennedy) was built by him in the year 1841. The dam at Reading (Poplar Neck) was also built under his supervision in the year 1838.

As Mr. Griscom was connected with the works for so many years, to him must be given the credit of organizing not only the working force for the repairs and maintenance of the canal and slackwater navigation, but also the building up of the boating interests and the transportation of freight and coal upon the navigation. In this connection it may be mentioned that for many years coal brought down by canal and destined for points on tidewater beyond Philadelphia, was trans-shipped at tidewater and sent by sailing vessels to New York, Boston and elsewhere. This trans-shipment of coal ceased about the year 1839 through the enterprise of Asa Packer, who came from the Lehigh Valley. He constructed and put into operation a fleet of boats called the "Packer Boats." This

ran as a through line, via the Schuylkill Navigation to tide water at Fairmount, thence they were towed to Bordentown on the Delaware river, and ran through via the Delaware and Raritan Canal to New York Harbor. They were the first boats supplied with hatches and made seaworthy, whilst the Schuylkill boats, not being covered with hatches, were unable to go to New York Harbor. They carried 60 tons each, and were taken around from Fairmount to Bordentown in tows of fifteen to twenty boats each. Mr. Packer, before he became interested in the Lehigh Valley Railroad, had a large interest in the Schuylkill coal trade and in boats on the Schuylkill Canal.

The years of greatest prosperity of the Schuylkill Navigation appears to have been from 1835 to 1841, inclusive, during which time the tonnage, not only of coal boats but of miscellaneous freight, increased by a large percentage from year to year, and there was a corresponding increase in the tolls collected, making it possible for the company to pay large dividends and at the same time to set aside a considerable sum of money for improvements and for the extinguishment of its debt. This period of prosperity was never equalled in any of the subsequent years of the operation of the Navigation.

Passing through the period of financial depression following the year 1837, it soon became necessary to reduce the tolls on coal, which depleted the revenues of the company to such an extent that in the years 1842-3 no dividends were paid. This was again followed by the necessity of enlarging the works to meet the increased competition of the Philadelphia and Reading Railroad, which had just gone into operation.

It was in the year 1843 that the effects of competition were first felt. The quantity of coal brought down by canal in that year was 447,058 tons, or nine per cent. less than the trade of the preceding year. This diminution had been caused by diverting a portion of the Schuylkill coal trade to the railroad.

The whole number of Schuylkill canal boats in use in 1843, was about 800. Of these, 278 were covered boats,

adapted to the through coal trade from Pottsville to New York; 434 were open coal boats for way trade, and 58 were lime boats and miscellaneous. In that day the burning of lime in the Schuylkill Valley was a large industry and the trade was almost entirely on the canal.

As an indication of the carrying capacity it may be stated that the direct trade to New York in 1843 amounted to 119,972 tons, taken through the Delaware and Raritan Canal, in 2,045 boat loads, averaging 58¾ tons each. Although this carrying capacity of the boats was a very considerable increase over what had prevailed before the first enlargement of the canal throughout, in 1834-5, when their capacity was only 60 tons, and although the time consumed in making the round trip was reduced one-half, nevertheless it was recognized that in order to compete with the railroad it would be necessary to very considerably enlarge the Schuylkill Navigation works.

The minimum depth of water in the canals and pools was originally thirty-six inches. It had been increased to forty-eight inches or four feet, in the enlargement of 1834, although there were many places where the depth was greater.

As a matter of maximum tonnage it is recorded that during the year 1843, with the levels kept as full as possible, one boat, No. 169, called the "President," went through from Pottsville to tidewater drawing forty-nine inches of water and carrying 71½ tons of coal. This was what may be called over-loading. The regular tonnage of the boats at that time was sixty tons. It was recognized that the only way in which to reduce the freights by canal as much as possible was to increase the carrying capacity of the boats, and this could only be effected by an enlargement of the works.

The enlargement of the Schuylkill Navigation of 1845-6 was brought about through the exertions of Solomon W. Roberts, President, and from the beginning of the discussion as to the plans, the question narrowed down to one of enlargement of the prism of the twenty-two miles of Girard Canal or of building a slackwater navigation in

the river instead. There was no question as to the remaining parts of the navigation. It was a slackwater throughout, with short connecting canals, and in a few instances, canals of three to four miles length, where the utilization of the river was not practicable.

The report to the Board of Managers upon the enlargement is dated January 2, 1845, and was approved by the stockholders. This was followed by the report of Edward Miller, civil engineer, of the improvement on the Schuylkill Navigation, dated 11th of March, 1845, in which the whole subject of the proper size of locks to be adopted, the depth to be maintained in the canals, and a supply of water for feeding the same, was gone over at great length. Mr. Miller summed up his conclusions as follows:

(1) The present Navigation is in many respects a very imperfect work.

(2) It can be improved by reducing the number of locks from 109 to 82 and increase the dimensions of the locks and canals so as to accommodate steamers and other vessels of 180 tons burden, at a cost of one million dollars, exclusive of damages, without materially interrupting the navigation, and at furthest, in time for spring trade of 1847.

(3) When thus improved the quantity of water required to pass boats will be much less than on the present navigation, and if necessary the supply may be hereafter increased to any extent that may be desired.

(4) The increased dimension of the works will reduce the cost of transportation between the coal region and Philadelphia to one-half its present rate and make a much greater proportional reduction on the coal taken to New York.

(5) The capacity of the enlarged works will be vastly greater than at present and they will be susceptible to further improvement at moderate cost to an extent practically indefinite.

The size adopted for the locks in this enlargement was 110 feet long and 18 feet wide, with 5½ feet of water on the mitre sills, and for the canal and in ordinary cuttings,

40 feet wide on the bottom and 58 feet wide at water surface, with a depth of 6 feet. The capacity of any canal is fixed by the size of the locks and the depth of water upon the mitre sills, as well as by the width and depth of the canals. The dimensions given above, adopted for the enlargement of 1846, have not been changed up to the present day.

The report of Edward Miller, before mentioned, was followed by an elaborate one on the position and prospects of the Schuylkill Navigation Company, made in 1845, by Charles Ellet, Jr., a civil engineer of great distinction, from which it may be well, as a matter of history, to quote:

"The Schuylkill Navigation Company was incorporated by an Act of the General Assembly of Pennsylvania in the year 1815, and the works were prosecuted in the face of numerous financial and physical difficulties to a successful completion in the year 1826. At this period the line terminated in the coal region and the company's revenue from the products of that district and other sources speedily augmented.

In 1829 the first dividend was declared, and in 1830 the trade was found to augment with such rapidity that the works were likely soon to prove inadequate. Measures were accordingly taken to increase its capacity by adding to the depth of the water and constructing an additional line of works. The capacity was thus greatly raised from a canal intended for the passage of boats of 25 tons burden, to a navigation adapted to the use of boats of 65 tons, the burden of the boats now in use.

In the progress of this enlargement many miles of the work was deepened sufficiently for the use of barges of 200 tons burden. It is proposed now to contract a loan for the purpose of removing one line of the old locks and substitute a line of new ones of enlarged dimensions to increase the depth and breadth of the channels where necessary, so as to obtain an uniform depth throughout the line, suitable for the passage of barges of 200 tons burden.

The estimated cost of this enlargement is $1,080,000."

The cost of the subsequent gradual enlargement, with

a new line of 51 lift locks and an entire change of location and reconstruction of six miles, to take the place of the Reading Canal, the increase of the width and depth of all the channels to accommodate boats of 65 tons burden was, $1,696,545, making the aggregate cost of the work in the year 1845, with all the company's real estate and water power, $3,896,545.

The success which followed the opening of the Navigation to the coal region was greater than the most enthusiastic friends of the enterprise had anticipated. The traffic increased with great rapidity and the ample revenues authorized the most gratifying dividends, which ranged from nine to twenty-four per cent. per annum, and the stock and loans of the company were sought as the safest investments of the day. This extraordinary success led the way to a change of fortune which resulted immediately from the construction of a rival work.

In 1829 when the company declared its first dividend the traffic all told was but 134,524 tons.

In 1832 when the dividends had reached 5½ per cent. per annum, the traffic was but 327,921 tons.

In 1835, when the dividends amounted to 15 per cent. per annum, the aggregate trade was but 535,194 tons.

In 1839, when the dividends amounted to 19 per cent. per annum, the trade was 686,716 tons.

In 1844 the canal was not earning a dividend. The total traffic amounted to 573,471 tons, and the company was in easy financial position without the embarrassment of any floating debt. It was earning only enough to clear its expenses and interest on bonded indebtedness.

It was the rapidly increasing anthracite coal trade from the Schuylkill region, the inability to handle it with boats of small tonnage, as well as the inability of the Navigation Company to compete with the railroad in the transportation of coal with boats of small tonnage, that made it the universal sentiment of those concerned in the Schuylkill coal business, and of the great body of residents and proprietors of manufactories along the line, that the canal should be considerably enlarged in its dimensions, in order

to accommodate the increasing trade, and also make it profitable to its stockholders.

The enlargement having been determined upon and approved by the stockholders at their annual meeting, in January, 1845, Mr. Edward Miller, a civil engineer of large experience, was appointed by the Board to take charge of the work; but in the month of April of that year he resigned and the work was reorganized in charge of three resident engineers.

The upper division, extending from the head of navigation to Althouse's (Leesport) thirty-one miles, was laid out and successfully executed under the direction of Ellwood Morris, civil engineer.

The next division, extending from Althouse's to the outlet of the Girard Canal, was placed under the general superintendence of Antes Snyder, civil engineer.

The work on the lower division, extending from the Girard Outlet to Fairmount, was conducted with indefatigable labor and attention by James F. Smith, civil engineer.

In prosecuting the work of the enlargement these men were assisted by Samuel Griscom, the general superintendent of the Navigation Company, and to whose zeal the company was indebted for the rapid and substantial execution of the work.

The final examination and surveys of these engineers resulted in a reduction of the number of locks from 109 to 70. They were designed to accommodate boats 100 feet long by 17½ feet wide, capable of carrying 150 to 200 tons of coal, and of being propelled by steam. The enlargement was prosecuted with vigor.

Fairmount Locks was first prepared for trade and opened for the passage of boats on the 4th of May, 1846. The Navigation was further opened as far as Phoenixville on the 29th of June and as far as Reading on the 11th of September. Boats of the large class of 180 tons were able to pass throughout the line from Port Carbon to Philadelphia on the 16th of November. Following the enlargement and at the beginning of the year 1847, the Navigation was in possession of large and well arranged docks and

landings at Schuylkill Haven, and were engaged in constructing others at Mount Carbon and Port Carbon, so that at the close of the year there were landing facilities for the shipment of 600,000 tons of coal per annum.

The company also had upwards of 600 cars of the most approved pattern, and the line was equipped with a considerable number of new boats of the increased size, adapted to the enlarged Navigation. These landing facilities were increased from time to time until they were adapted to the shipment of a million and a-half tons of coal per annum, and the number of cars was increased until in later years it reached 3,400, which were run upon lateral roads of Schuylkill County under agreement with the Philadelphia & Reading Railroad Company, thereby bringing the trade from the mines to the boats. These Navigation cars for many years were known by their color, and were called "yellows," by railroad men, to distinguish them from the "blacks," the color of the railroad cars.

After the enlargement of the canal about 600 boats were regularly engaged in the trade, many of them running through to New York and on Long Island Sound, as far as New London, Connecticut.

The works of the Navigation were practically new and in superb order. It was well equipped for trade but was not in position to surmount the financial difficulties brought about by the suspension of the Navigation for the entire year of 1846, the loss of its trade, the depreciation and casting aside of the small boats formerly used, and the necessity of expending a large sum of money to create a new boat stock. It was extremely difficult under these conditions to earn sufficient money to provide for the bonded indebtedness and floating debt.

About 1847, Frederick Fraley, a man of large experience and great ability, was elected president, and remained with the Schuylkill Navigation Company in that capacity until the lease of the works to the Philadelphia and Reading Railroad Company in 1870, a period of twenty-three years.

To overcome the difficulties outlined above, one of the

first acts of President Fraley was to negotiate a loan of $3,600,000 to take care of the liabilities of the company and to provide a fund for procuring an additional supply of boats, cars and landings. In the year 1849, there were 392 boats and scows engaged in the coal trade, and 138 in miscellaneous trade.

In order to increase the boat stock which it was recognized was too small for the trade of the Navigation, it was necessary in 1849 to create a new loan for the express purpose of building boats. This loan was called the Boat Loan Trust, and out of it grew the leasing of boats to individual captains, who by that means were not only enabled to take care of and gradually pay for their boats, so that they became owners, but at the same time made good wages. This method of carrying on transportation in the hands of individual owners and the leasing of the company boats was carried on until the year 1870, when the Schuylkill Canal Transportation Line was formed.

The administration of President Fraley from 1849 to 1870 was a vigorous one and full of interest to those who were identified with the Schuylkill Navigation Company. He built up the coal tonnage of the canal until it reached the maximum in 1859, of 1,699,101 tons, of which 1,372,109 tons was of anthracite coal. There were about 1,400 boats of 180 tons capacity each, on the canal.

Notwithstanding this great increase of tonnage the canal was never able to overcome its financial difficulties, and to recover from the disaster which befell it.

One of the greatest of these was caused by two floods in the river during the year 1850. One on the 19th of July, and the other on the 2nd of September. Of these Mr. Fraley says in his report for the year 1850:

"On the 19th of July last, the first of the two great freshets of the year occurred and injured in its progress several important portions of our line, but the whole canal was made navigable by the 26th day of August and shipments of coal resumed with unusual activity, but the second great disaster of the year rendered all that had thus been restored useless.

On the 2nd of September last, our history is marked by a flood, with which nothing that has heretofore occurred in the Valley of the Schuylkill within the memory of man can be compared. In the great elevation of water, in the destruction of property and life, and indeed in all its accompaniments, no living witnesses have seen its parallel.

The wreckage included dams and guard banks, canal embankments and lock-houses. Of the dams twenty-three received more or less injury and two required to be entirely rebuilt. The most important of these was situated in the gap of the Blue Mountains and was about 35 feet in height.

In the same flood the lower Tumbling Run Reservoir was nearly destroyed and a large section of the embankment was carried out to its foundation."

Notwithstanding the great damage done, the works were repaired and business resumed between Philadelphia and Reading, sixty-four miles, on the 14th of November following, and the remaining section, above Reading, including the Blue Mountain Dam was finished and ready for navigation early in the following spring. The loss of trade and revenue, and the cost of repairs was great.

At the opening of navigation in the spring of 1853, the facilities for shipping coal at Schuylkill Haven were very much enlarged by the opening of a new dock, called the Lippincott dock, which furnished about 3,000 feet lineal front of landing, and which was intended to take care of the trade from the Mine Hill and Schuylkill Haven Railroad at the same time. The maintenance and repairs were placed under the direction of James F. Smith, resident engineer, and the supervision of the cars, landings and shipment of coal under Edward T. Warner, and the boats and towage were attended to by Philip D. Thomas.

This systematic sub-division of the work of the Navigation led to favorable results in the business of the year 1852, and practically the same system was carried out in the operation of the Navigation until the leasing of the canal to the Philadelphia and Reading Railroad Company in 1870.

During this period the Philadelphia and Reading Rail

road Company was an active competitor of the Navigation Company for the anthraicte coal trade. The latter had a through water route to New York harbor, and to points east, without reshipment, whilst the rail route involved transfer to vessels at Port Richmond. The coal tonnage of the canal during the season of navigation was greater than that of the railroad for many years, and it was not until after the year 1867 that it began to decline.

In all the years, except two from 1855 to 1867, inclusive, it was over one million tons for each boating season. The total tonnage of coal for the thirteen years was 15,003,500 tons, an average of 1,154,000 (nearly) for each boating season, and the maximum was in the year 1859, when 1,372,000 tons were carried, of which nearly one-half, or 646,178 tons went to New York and vicinity.

The handling of so large a tonnage required the maintenance, on the part of the Navigation Company, of its own coal cars, for use on the lateral railroad, and its own locomotives for working the landings at Port Carbon, Mount Carbon, Schuylkill Haven and Port Clinton.

The number of cars reached 3,400, many of which were built in the company's own shops at Reading, including all the iron work, wheels, axles, etc., and the repairs of cars were kept up in shops for that purpose at Port Carbon and Schuylkill Haven.

For a number of years following the enlargement of the Navigation works in 1846, the company controlled, in a measure, a number of the lateral roads, which were owned and managed by separate and distinct corporations. Through this control it was able to bring from the mines to the canal at its shipping landings a large coal tonnage, which might otherwise have been diverted to the railroad. One of these arrangements, which at the time was referred to as the most important for business that had been made since the enlargement of the Navigation in 1846, was the contract entered into with the Mine Hill & Schuylkill Haven Railroad Company, to continue for ten years from January 1st, 1862, and which placed the Navigation Company in an independent position for participation in a fair

proportion of the coal trade of Schuylkill County. It was from the Mine Hill & Schuylkill Haven Railroad that the Navigation Company had heretofore derived the largest portion of its tonnage. The trade for the year 1861, for example, being 812,013 tons, out of the total tonnage for that year of 1,183,570 tons.

This active competition led to an agreement between the Railroad Company and the Navigation Company in the year 1864, under the terms of which the coal trade was divided under certain restrictions, in the proportion of fifty-five per cent. to the railroad and forty-five per cent. to the canal, an arrangement which naturally led up to the lease of the works of the Schuylkill Navigation to the Philadelphia and Reading Railroad Company, under agreement dated the 12th day of June, 1870.

The leasing of the canal, corporate rights and franchises, of the Schuylkill Navigation Company for the term of 999 years, from January 1st, 1870, was brought about by the inability of the Navigation Company to meet its financial difficulties, caused in part by the disastrous flood which occurred in the Valley of the Schuylkill, on the 4th day of October, 1869, (a little more than nineteen years after the disastrous flood of the year 1850), and which damaged the works greatly, causing an entire loss of trade for a month thereafter. This, following the stoppage of navigation by the city of Philadelphia on the 11th of August, 1869, during which time the Navigation was suspended by the illegal action of the city in drawing the dam and levels of Fairmount pool for the supply of water power to the wheels at Fairmount, so interfered with the operation of the Navigation that the company was not able to meet its expenses and was financially embarrassed from early in August until the close of navigation.

The winter following called for the expenditure of a large sum of money to make permanent repairs where damage had been done by the flood of October, 1869. In consequence the Navigation Company entered upon the spring of the year 1870 with its finances in straightened condition, and the lease of its works to the Philadelphia

and Reading Railroad Company followed shortly thereafter.

The canal was operated by the Philadelphia and Reading Railroad Company, as lessees, from July 1st, 1870 until the close of the year 1886, with its transportation in charge of Mr. T. C. Zulick, Superintendent of canals, at Schuylkll Haven, and under his supervision a transportation line was organized operating at one time about 850 boats.

There were relay stations at an average distance of twelve miles, with accommodations for teams and drivers. This line operated through to New York and to points on Long Island Sound, and in that period of years successfully carried on the transportation of a large tonnage of anthracite coal.

The works were maintained by the Railroad Company, lessees, to a high degree of efficiency, but nevertheless canal transportation, as the years went by, compared unfavorably in net results with railroad transportation, so that at the close of the year 1886, it was found to be desirable to transfer the greater part of the boat stock to New York harbor, to be used as lighters.

The larger part of the tonnage of anthracite coal which had formerly gone by canal was transferred to the railroad. Since the year 1887 the works of the Navigation have been maintained as before, in a good state of repair, but the tonnage has been limited to what can be handled economically upon the line of canal and shipments to tidewater have been almost entirely discontinued. The miscellaneous trade, which in years past was large, has also left the canal. The reason for this being that it is no longer considered essential to locate a manufacturing establishment upon the water front. The locations sought are those upon railroads of the country, and this of itself leads to the diminution of canal traffic.

These conditions have not been brought about in any large degree by the railroad companies of the country. It is the natural drift of things and the desire of manufacturers to locate on the railroads for the easy and economical handling of freight, and the inability of small canals, working under local conditions, to compete with the great rail

way systems of the country. In other words the operations of canals were confined to a limited area, whereas a loaded car could be sent from New York to San Francisco, or from Maine to Mexico.

The Schuylkill Navigation in its day filled its place and did a great work. Whether it will ever again be filled with traffic is a question that under present conditons of the transportation of freight in this country cannot be answered. In some European countries the heavier and coarser freights seek the canals and rivers, whilst the railways are crowded with the transportation of passengers and high class freight, but these conditions are not likely to be reached in this country for many years.

The Schuylkill Canal—Part II.

By A. A. Hesser. Read Before the Society April 28, 1909.

In the early days of the Canal, we find that the transportation of coal and freight was done in a very crude manner, and in boats that carried but a very small tonnage in comparison with those used at a later date.

Miss Sarah McCool, of Pottsville, states as follows: "The first canal boats run on the Canal were built at Orwigsburg about 1822 by Jacob Huntzinger and George Reichart. They built the boats complete in all their parts, and conveyed them to the Canal above the Five Locks, about one mile north of Schuylkill Haven, where they were launched. The boats when fully freighted, carried thirty tons. These boats were built for general traffic. They took lumber to Philadelphia and returned with store goods. The principal boat was named the 'Orwigsburg Landing' boat.

"One of the boats made the trip to Philadelphia drawn by four or five men. It took ten days. Jacob Huntzinger, Jr., was the captain. There were no tow paths, and the boats were sometimes poled, and sometimes drawn by men."

Elijah B. Reed, born in 1822, and a resident of Orwigsburg, says:

"The first canal boat was built at the latter place by William Wildermuth, and was hauled to Schuylkill Haven above the five locks on a wagon drawn by six horses, as mules were then unknown."

The following was furnished by Michael McDermit, of North Manheim Township, Schuylkill County, born in Philadelphia October 25, 1816, being now in his 93rd year but clear in his mind:

"In 1833 the boats on the canal carried thirty tons each. The first boat was built at Orwigsburg and hauled to Schuylkill Haven on a wagon. The weight of the boats was from eight to ten tons, and seventy-three feet

long, thirteen feet wide, and four feet deep. There were nine ferries on the canal by which men and horses were transferred from one side of the river to the other, at the breast of the dams. These ferries were operated by hand. At a later date bridges took their place."

Mr. McDermit also states that the first boat of a larger size holding forty tons was built at the boat yard in Landingville about 1840 by a man named Sullivan. It was called the "Irish Hero". George Lyons ran the boat. The trip to Philadelphia and back to Pottsville lasted ten days, five to go down, two days to dispose of the cargo, and three days to return.

In connection with the above, Dr. Edward Heiser and Henry Byerle, both of Pottsville, but who spent their early days in Schuylkill Haven, give the following facts:

The Schuylkill Canal was opened to traffic in 1825. Its length from Philadelphia to Port Carbon was 108 miles. The surface was from 60 to 300 feet wide, with an average depth of 6 feet. In some places it was so shallow that the boatmen had to wade in and shove the boats through.

Dr. Heiser gives the following names of persons who pulled the first boat through by hand to Philadelphia: Samuel Byerle, George Reichart, Swalm, Werkheimer and one Sterner. The first boat load of coal was pulled by hand to Philadelphia by Peter Ream, John Rudy and Daniel Byerle. John Shoemaker had previous to this hauled coal to Philadelphia in a wagon.

In 1850 the canal was enlarged and improved.

The Valley of the Schuylkill before the canal was built was a scene of great beauty, with its winding stream of pure and clear water, well stocked with fish, and having many hills covered with forests along its banks. Before it was settled, it afforded an admirable hunting and fishing ground for the aboriginal inhabitants.

It was also beautiful after the canal was built.

The canal had a large number of locks, with their tenders, who generally consisted of elderly couples as the locks were not safe places to raise a family of children. The lock tenders had to be constantly on the watch, for the boatmen had their signals, which consisted in blowing

their horns, when approaching at night, a post erected at a distance of forty rods from the lock. The boatmen were not permitted to pass this place until they received a signal from the lock tender that all was safe, by showing a white light. If the light was red, it meant danger, and they were not allowed to pass the lock.

The Valley of the Schuylkill had many places of historic interest. Before the Revolution there had been a great deal of trouble with the Indians in this part of the State, especially in the vicinity of Schuylkill Haven, Landingville and Orwigsburg. Many depredations were committed on the early settlers. Their families were massacred, their buildings burned, and their children carried into captivity.

During the Revolution the lower part of the Schuylkill Valley witnessed many stirring scenes.

In 1777, the British having occupied the city of Philadelphia, Washington was forced to move his army to Valley Forge on the Schuylkill, where the Continental Army had their quarters, during the winter of 1777 and 1778.

In the spring of 1778 Washington crossed with the army from the west side of the river to the east. Part of the army, eleven thousand strong, crossed at Swedeford. The rest, with the artillery, under Gen. John Sullivan, crossed on a temporary bridge below Valley Forge.

Frederick Hesser, the grandfather of the writer, was a drummer boy in the army at that time, and afterwards resided in Orwigsburg.

The site of the bridge was marked by the boatmen of the canal under the following circumstances, as related by Valentine Fry, of Schuylkill Haven:

In 1837 the canal company moved the tow path at Catfish dam from the east side to the west. This tied up a number of boats at that point, and the boatmen, having resolved to mark the place of crossing, made a collection for that purpose. Then a party went down the canal, in a scow and purchased a white marble stone. This was erected near the river, on the place where the Continental Army had crossed. The stone was still there in 1905.

According to Edwin F. Smith, Superintendent of the Schuylkill Canal, the stone on the west side of the canal

was placed there in 1840. He also gives the marking on the two stones, on the west side of the river.

The next one to the river "A. D. 177—Sullivan Bridge", and the one next to the railroad, "A. D. 1778 Spencer Bridge". So that it may be that one was erected in 1837, as stated by Mr. Fry, and the other in 1840, as stated by Mr. Smith.

Mr. Smith further states that there is on the east side of the river a sandstone, erected to mark the site of the bridge, and having the following inscription: "I. V. A. N." "I. D. G. E." It is not known when or by whom this stone was placed there. This bridge was also known as the Spencer Sullivan bridge and is referred to in one of the early surveys of the Schuylkill Navigation Company. Its location was at the extreme lower end of Flatland Island, was about 500 feet long, and of sufficient width to permit a single line of artillery to pass. The foundation of the bridge was a line of low crib-work piers, in deep water on the east side of the island, with rough hewn logs laid thereon, as string pieces, and these covered cross-wise by closely laid round or flattened logs, to form a floor, about 16 feet wide. The cribs and foundation work on the east side of the river, being in the main channel, would naturally be carried out by ice freshets, after they had served their purpose for Sullivan's crossing. On the west side of the river, they were an obstacle to navigation, and were removed by the dredging machine of the canal company in 1844, thus destroying the last remnant of Sullivan's Bridge. The cribs were of wood cut in the forests on the river banks, and were about twenty feet apart. The place has always been known as "Sullivan's Crossing".

In July, 1907, George ————————, Division Foreman of the Canal, made an inspection of the stone on the west side of the river. He states that the size of the stone is 24 inches high, 12 inches wide, and 4 inches thick. It is marble, and bears the following inscriptions: Side next to the river

A. D. 177—Sullivan Bridge,

side next to the railroad

D. 1778 Spencer Bridge.

Erected by the Schuylkill Boatmen, 1840.

The stone on the east side of the river had been broken off about three years before his visit.

Michael McDermit, already referred to, says further, that:

A marble monument was placed by the boatmen, at the place where Washington crossed the river. The contributions were from 25c. to $1.00 each, and he contributed 50c., of which fact he was always very proud. The stone was purchased at Norristown and cost $18. As there was a balance left over, the boatmen all had a drink to the honor of Washington and his Army. At that time the dam was broken, and the stone, which was about 6 feet long, 1½ feet wide, and 4 inches thick, had to be carried about a mile by the men. It was then placed in position, and speeches were made.

As boating was a new enterprise, the persons engaged in it were gathered from all kinds of men and boys. The new occupation being an attractive one, many mechanics, farmers, laborers, etc., left their former callings to engage in it. As a rule, they were honest and well behaved citizens, but there were others who engaged in the business in order to commit depredations.

Among the latter was a gang of boatmen known as the Schuylkill Rangers, who had banded themselves together to perpetrate robberies, murder, and all kinds of crime. They were considered to be the Pirates of the Canal, and came from Philadelphia, on the east side of the Schuylkill River, between Market and Shippen Streets. The leaders of the band were William Katon and a man called Red Larry Carrol. The former was an intelligent and fine looking man and had been educated for the priesthood.

The Schuylkill Rangers were in existence and committed crimes on the Canal from 1840 to the early 50's.

Michael McDermit, before mentioned, states that it was useless to resist them, and he always let them have their own way. He tells of a boatman called Peter Berger, who had a boat called "The Rattlesnake", who when the Rangers came to his boat, (in Philadelphia) to rob it, shot two of them dead, for which he was afterwards presented by the Mayor of Philadelphia with a fine revolver.

Dr. Edward Heiser and Mr. Henry Byerle give the following account of these Rangers:

The band of outlaws originated in Philadelphia. They assumed the style of the Colonial or Revolutionary wars. They were murderers and robbers, and not only plundered the boatmen, but also the farm houses near the Canal. The Rangers went in parties, making their attacks at night; and were generally armed with flintlock muskets, or some other weapons. The Rangers were not all boatmen.

They made an attack on the house of one Philip Moyer, at the first lock, half a mile south of Schuylkill Haven. The house was stoned and battered.

The Rangers one night attempted to take possession of Schuylkill Haven, and the citizens in consequence resolved to crush them. They were armed and numbered about twelve men. The Rangers were driven into the "Covered Bridge", and the town men, dividing into two parties and taking position on each side of the bridge, at the entrance, poured a crossfire into it, killing one of the Rangers, and driving the rest out of their stronghold. This ended the fight. The following morning the town people arrested three of the outlaws, on a scow, below the Schuylkill Haven bridge. Four more were taken at the Canal Landing dock. They were taken before a squire, and handcuffs being then unknown, their hands and feet were secured with ropes. In this condition they were taken to Orwigsburg. On another occasion the boat of Henry Boyer, of Reading, was passing through Fairmont Dam at night. As Boyer expected an attack, he told his driver to signal him, and lay down on the deck armed with a sharp ax. He heard the driver's signal and several Rangers sprang on board, but Boyer rushed in amongst them, striking right and left with his ax, and routed them all.

At another time a boat belonging to John Hesser, with crew consisting of Hesser, Heiser and a driver, were below Dauberville, and passed several boats belonging to Rangers. One of them hailed Heiser, and asked him how he was going to vote, and, receiving no answer, sprang ashore, making threats, when Heiser knocked him down and thrashed him. The Rangers hearing, pursued Hesser's boat, mounted on mules and horses, and armed with Flint-

lock muskets, to the number of twenty. They reached Dauberville before the boat. Having no gun caps, they tried to get a supply in the town, but did not succeed. When Hesser arrived and saw the condition of affairs, he drew his boat to the opposite side of the canal and abandoned it, himself and crew taking refuge in a farm house. They were going to scuttle the boat, but the next day with the help of the people of Dauberville, it was restored to its owner.

Mr. Heiser also gives the following information regarding Peter Berger: The boat of Peter Berger and Edward Heiser was attacked by Rangers one night at Vine St., Philadelphia. In the fight Berger killed a Ranger. Heiser and Berger were then arrested by the police. When brought before a magistrate, they were acquitted, the magistrate saying: "Your pistols did not work well this time. You only killed one man. The next time kill all you can."

In writing the history of the Canal, it would be incomplete without giving an account of the floods of 1850, as they caused heavy losses to the Company, and was their first serious disaster.

The first occurred on July 18th, and caused great damage. This was followed by the great flood of September first. This rain began Sunday evening, and by daylight of September 2nd a freshet had commenced which caused destruction on every side. The Miners' Journal of March 27th, 1899, gives the following account of the disaster, given by an old resident:

"It commenced raining on Sunday, September 1, 1850, and continued at intervals throughout the day. At night the storm set in with increased fury and with hardly a cessation. The rain came down in torrents until Monday morning. It is estimated that the depth of water falling in that one night was six inches. It continued to rain moderately until noon. Early in the morning the news spread through Pottsville that the Tumbling Run dams, the feeders of the Canal, were unsafe. The water in the Schuylkill was already higher than at the previous freshet. At 9 o'clock the water overflowed the embankment, and in a few minutes a large breach was washed out and an immense

body of water poured down through the valley below. About eight houses were entirely swept away, together with the embankment of the canal, and also the Schuylkill Valley railroad for about fifty yards. All the houses in the immediate vicinity of Mt. Carbon below the Mansion House were flooded to the second story, the water being over the railroad below the depot. The county bridge connecting the turnpike and Mt. Carbon, with the heavy railroad bridge, were both carried away, the latter lodging about two miles below. The Navigation warehouse was considerably damaged, as was also a small frame storehouse connected with the railroad depot. The dam measured fifty feet high, and the average water at the breast, when full, was about thirty feet. It covered from thirty to forty acres of ground. About half of the embankment to the foundation was carried away, leaving the upper dam entirely whole. The two bridges over the Schuylkill, opposite the Island furnace, were destroyed, together with several buildings on the island. Captain Downey's storehouse shared the same fate, and was dashed to pieces a short distance below.

No lives were lost at Mt. Carbon, but at Schall's Forge, two miles above Port Clinton, fourteen persons were drowned, and sixteen houses and other buildings carried away by the flood.

At Port Clinton the water was several feet higher than in the July freshet. Lynn's store was much injured with all his goods. The foundry with out-buildings, a tailor shop, blacksmith shop, and twelve houses were destroyed. The railroad bridge connecting the Little Schuylkill with the main road was also carried away, and the Blue Mountain bridge, below Port Clinton, with about nine hundred feet of the railroad washed out.

The lower part of Port Carbon was entirely submerged. The grist mill of Hammer and Leib had little damage, but the injury done to the foundry and machine shops of Mr. Wintersteen was estimated from $3,000 to $5,000. The office connected with the foundry and machine shop of Mr. Silliman was destroyed. The store house of Baber & Wattron was swept away with all the hay it contained.

The Lock House of Schuylkill Canal was destroyed by a boat passing through it, and traffic over the Valley Railroad was interrupted for ten days.

At Schuylkill Haven the Reading Railroad bridge was crippled. The Navigation Company's railroad bridge to Dundas landing was partly swept away, and over 5,000 tons of coal was washed from the landings into the docks. Mr. Payne lost from 1,000 to 1,500 tons and Mr. Heckscher about twice the amount. Mr. Kaer also lost 500 tons. Between Pottsville and Schuylkill Haven the damage to the Canal embankments was very great. The Schuylkill Valley was strewn with the wrecks of boats, lumber, furniture and fragments of buildings.

The Reading Railroad between those places sustained little damage, except in one place, where the embankment was washed for ten yards.

The toll gate house, one mile below Mt. Carbon, was almost wrecked, and a house, known as Fraileyville Hotel, was literally razed from its foundation. The house of Mr. Campbell was also washed away. All these three were substantial buildings. A mile down the valley a house, barn and saw mill, owned by Mrs. Minnich, were destroyed. Mrs. Minnich and three others of the family having scarcely time to escape. The county bridge at Schuylkill Haven was also carried away. The telegraph and mail service were interrupted for several days. The damage done to the Canal was two locks washed away between Pottsville and Port Clinton.

The above information was given by the late Benjamin Kline, an old boatman, who resided for many years in Dock Street, Schuylkill Haven.

At this date, 1909, the Schuylkill Canal is still open from Port Clinton to Philadelphia, for a few boats.

But, in all probability, its usefulness is past. But, having had a long and useful career, it can afford to retire from business, and give place to something more satisfactory to the present fast age.

Schuylkill Chronicles for the Year 1829.

Gleaned From "The Register of Pennsylvania" by H. J. Herbein.
Read Before the Society May 25, 1910.

The issue of January 3rd published a tabulated report of a committee of the Legislature. This table shows that in 1824 there were 24 Justices of the Peace living in Schuylkill County.

The issue of January 10th, 1829, contains the "annual report of the President and Managers of the Schuylkill Navigation Company to the Stockholders, for the year 1828."

In part the report says, "Anthracite coal, the use of which a few years ago was unknown, and of which in 1820 only between three and four hundred tons were consumed, has now become an article of the first necessity, and the consumption has advanced to upwards of 75,000 tons a year and is constantly increasing; so as to warrant the belief, that the demand will be fully equal in a few years to the means of supply, and thus afford a bountiful return to the Stockholders for the long privation of the income of their capital, advanced to forward a magnificent work, and one so important to the State.

"The quantity of coal which was brought to market last season was 47,284 tons, and in 1827 only 31,360 tons, showing an increase of 15,924 tons, or more than 50 per cent., which increase is very nearly equal to the whole quantity brought down in 1826, which was 16,767 tons.

"The whole amount of the tolls last year was $87,171, of this there was derived from coal $46,202."

February 7th, 1829, is published from "Miners' Journal". "Pottsville, Improvements and Prospects. Twenty houses are building here, and in the Spring a number more are to be erected. Yet the demand is unabated.

"In 1824 the site, which is now so well covered, boasted but five houses. The rapid growth of the place is but the

The Schuylkill Canal—Part III.

By H. C. Wilson. Read December 20th, 1912.

Three hundred yards below the mouth of Mill Creek, Port Carbon, on the southern bank of the now filthy stream dignified by the name of Schuylkill River, stands a small stone house. Near it, in the river bed, barely visible in the refuse washed down from the mines, are the remains of masonry. One hundred and eight miles away, a short distance below Fairmount dam, Philadelphia, there is a neat brick dwelling, surrounded by flower beds, and facing a canal lock in good order. These two buildings mark the termini of that system of navigation known as the Schuylkill Canal, whose history and useful purposes accomplished have been dwelt upon in former papers read before this Society. The stone house was the home of the locktender at lock and dam No. 1. In the brick dwelling lives the locktender for lock No. 72. Between these two points, during the many years that the canal was in active operation, passed hundreds of boats, carrying cargoes aggregating many millions of tons, consisting mostly of coal mined in this county.

It is the purpose of the present paper to describe principally that section of the canal which has been abandoned, lying wholly within this county and extending from Port Carbon to Port Clinton, and to show the state of ruin into which the works of the canal have fallen, giving, also, some details not touched upon in the papers heretofore prepared by Mr. Smith and Mr. Hesser.

The canal was originally constructed, about 1818, only to Mount Carbon. In 1828 it was extended to Port Carbon, at which time dam No. 1 was built. This dam formed a pool in which were erected what were known as the Coal Street landings, a short distance above the

bridge leading from Port Carbon to Palo Alto. From here, until 1853, were sent cargoes of coal which were taken not only to points between Port Carbon and Philadelphia, but, by means of other canal systems (notably the Delaware & Raritan Canal) and towing by tugs, to New York, Chester, and even to Washington, D. C. Some boats, indeed, built specially of a shorter length than the regular Schuylkill boats, were towed up the Hudson River and navigated the Erie Canal, whose locks are somewhat shorter than those of the Schuylkill Canal. Dam No. 1, however, was abandoned, together with its wharves and landings, in 1853, on account of the difficulty in maintaining sufficient depth of water, by reason of the coal dirt washed into it from the mines. New docks and landings were then erected at the upper end of Palo Alto, a short distance below the wooden railroad bridge known as the Black Bridge, which has, within the past two years, been replaced by a concrete structure. This point then became the upper terminus of navigation, and continued so until 1872, when the canal was abandoned to Schuylkill Haven. Dam No. 1 was maintained as a dirt catcher, its existence as such being deemed necessary for the proper operation of the canal below. It was the filling of this dam with dirt, and the consequent raising and backing of the waters of the Schuylkill into the town of Port Carbon, that gave rise to perhaps the first of the many suits for damages resulting from coal dirt, that have occupied the time of our courts. A resident of Port Carbon, named McDonough, successfully prosecuted a suit against the Schuylkill Navigation Company for injury to his property and the health of his family, from the above cause. The case reached the Supreme Court in 1857.

Proceeding down the line of the canal, we find that the heavy fall in the river was overcome by many locks and dams. The difference in elevation between dam No. 1 and Fairmount dam is 618 feet, and 265 feet of this is between Port Carbon and Hamburg. The Blue Mountain dam at Port Clinton is No. 16 and its locks are numbered 28 and 29. With this large number of locks and

dams in a distance of about twenty miles, many of the levels connecting the locks were very short, some only a few hundred yards, and none a mile in length. Considerable time, therefore, was required in locking through the Schuylkill County section of the canal, and especially between Port Carbon and Schuylkill Haven. In this short distance there were eleven lift locks, having a total lift of 109.32 feet, and seven dams. The locks had varying lifts, depending upon convenience of location, length of levels and dams, etc.

The following table, copied from a profile of the canal, gives the lifts of locks Nos. 1 to 32, inclusive:

No. 1.	Port Carbon	4.8	ft.
No. 2.	Palo Alto	9.8	ft.
No. 3.	Pottsville Junction	5.8	ft.
No. 4.	Opposite Main St., Mt. Carbon	6.0	ft.
No. 5.	At turnpike bridge, Mt. Carbon	8.4	ft.
No. 6.	Cape Horn	9.47	ft.
No. 7.	Below Cape Horn	12.75	ft.
No. 8.	Below Cape Horn	10.25	ft.
No. 9.	Waterloo Guard	——	
No. 10-11.	Waterloo Locks	28.25	ft.
No. 12.	Bausman's, Coal St., Sch. Haven	13.8.	ft.
No. 13.	Schuylkill Haven Guard	——	
No. 14.	Foot of Canal St., Sch. Haven	12.2	ft.
No. 15.	Bowen's Outlet	6. 4	ft.
No. 16.	Farquhar's	7. 3	ft.
No. 17.	At Storage Yard	6.4.	ft.
No. 18.	Landingville	5.4	ft.
No. 19.	Tunnel Guard	——	
No. 20.	Tunnel Lift	11.6	ft.
No. 21.	Tunnel Outlet	8.7	ft.
No. 22.	Scotchman's (Auburn)	7.3	ft.
No. 23.	Log Cabin	10.95	ft.
No. 24.	Lord's	9.95	ft.
No. 25.	Rishel's Outlet	14.0	ft.
No. 26.	Hummel's	8.9	ft.
No. 27.	Port Clinton	10.3	ft.
No. 28-29.	Blue Mountain	24.9	ft.
No. 30.	Kernsville	12.10	ft.
No. 31-32.	Hamburg Five Locks (Garber's)	28.6	ft.

The Palo Alto docks were situated at the head of dam No. 2. Near the breast of the dam was Young's Landing, on the one side, and on the other were the Haywood rolling mills and the railroad roundhouse. The lockhouse at lock No. 2 is still standing, to the rear of the Sailor Planing Mill, but the lock and a portion of the level below it have been filled in with dirt. Part of this level still contains water; it is called the dock, and is sometimes used as a swimming hole by the boys. This level and the two short levels below it, extending to the turnpike bridge at Mount Carbon, were known as the three Greenwood levels. The first skirts the island on which the old Pioneer Furnace stood, and from it, up to shortly before the Civil War, a branch canal extended, with several locks and pools, to the point now occupied by the Philadelphia and Reading passenger station in Pottsville. On this island, about the same period, was a boatyard, conducted by the father of Charles Shelly, one of our present court officilas. To this point, also, were brought cargoes of ore for the furnace.

Lock No. 3 stood near the point where the Pennsylvania railroad crosses the Reading at Pottsville Junction. Lock No. 4 was directly opposite Main Street, Mount Carbon. Before moving up to the island, Mr. Shelly had his boatyard here. These two locks, together with their lockhouses, were destroyed in 1884, by the Pennsylvania Railroad Company in an attempt to use the canal property in the construction of its line. Opposite lock No. 4 was also erected dam No. 3, below which were the Mount Carbon landings.

From the third Greenwood level, boats passed through lock No. 5 and under the old wooden bridge spanning the river at Mount Carbon (replaced by an iron bridge in January, 1894) into a dam which has, during the past two years, been filled in on its eastern side, shifting the public road further to the west and enabling the Pennsylvania Railroad Company to extend its yard over the old road; and automobiles now speed over the same course formerly taken by canal boats. An old,

The "Black Bridge" at Mount Carbon

wooden railroad bridge, covered with tin, and also known as the Black Bridge, still stands in place across this dam. It is the only remaining bridge of its type between Pottsville and Philadelphia. Prior to the construction of the track at Pottsville Junction, all trains from Pottsville to Frackville and Tamaqua crossed the canal at this point. This bridge was erected in 1851 to take the place of the bridge carried away by the flood of 1850, when Tumbling Run dam burst, and its use was abandoned in 1911; it still bears the date "Jan. 1851."

Into this dam also entered the feed waters from the Tumbling Run dams. Leaving it, a guard gate gave entrance to the Mount Carbon level, which extended 1140 feet from the dam to lock No. 6, at Cape Horn. Here a towpath bridge led to the western bank of the river, right below the old rolling mill, and the boats made the sharp turn of the Cape Horn dam and floated through another guard gate into the upper level of the Second Mountain Canal, just below where the electric railway bridge now crosses the river. Lock No. 7, at the end of this level, is still in place, and, with tall trees growing from its depths, is the most picturesque of all the abandoned locks of the canal. The electric railway is located on the towpath of the two levels above and below this lock.

Below lock No. 8, near the point where the electric railway turnout is located, the towpath shifted by means of a bridge to the eastern bank of the river, and the Waterloo level was entered through a guard lock at the dam just above Seven Stars. This level was the longest encountered up to this point, and extended for nearly a mile to the double lock, variously known as the Waterloo lock, Warner's lock, and the Five Locks. This lock was torn out in 1897. It stood only a few feet above the Lehigh Valley railroad bridge crossing the valley. Prior to the enlargement of the canal in 1846, there were five locks at this point, arranged in two parallel tiers, the one of two and the other of three locks. Through the one set of locks the northbound boats passed, and through the other the southbound. Though the five locks were

replaced by one double lock, the name was retained until the canal closed, and is still occasionally used. Between this lock and the Centre Turnpike stood a large house, known as the Waterloo house, which was for some years the home of J. H. Filbert, Esq. It was torn down when the Pennsylvania Railroad was built. This house was built by the Navigation Company, and at the time of the leasing to the Philadelphia and Reading Railroad Company in 1870 was the home of E. T. Warner, one of the canal superintendents. Fronting on the turnpike, and with the grounds about it beautifully planted with flowers and shrubbery, it was regarded as quite a mansion. At the lower end of the locks there was a repair shop for boats. The electric railway is also constructed on the towpath of the Waterloo level.

Below the Five Locks is a section of the canal around which cluster a host of memories. Here, on the eastern bank of the Spring Garden level, was situated the Navigation Company's boatyard, where boats were built and repaired. Three dry docks were in use. This yard was in operation until the spring of 1887, and, although the canal was shortly to close down, the last work done was the launching of two new boats. Crossing this level, at the place where the trolley station at Connor's Crossing now stands, was a bridge which was taken away in 1898, and below the bridge a wharf, with derrick, where lime boats discharged their cargo. Along the towpath was a wharf where ore was unloaded. This level terminated in lock No. 12, known as Bausman's lock,* situated in the North Ward of Schuylkill Haven. A few yards to the east of the lock stood the large brick build-

*The following partial list of locktenders who were on duty about the period of the lease of 1870, was furnished by Mr. Joseph Borda, of Schuylkill Haven. Most of these locktenders served for for many years. Lock No. 2, Solomon Bowman; Lock No. 3, Patrick Welsh; Lock No. 4, Mrs. Heller; Lock No. 5, William McClain; Lock No. 6, Michael Conley; Lock No. 7, Elijah Warner; Lock No. 8, Adam Moore; Lock No. 9, Daniel Sullivan; Lock No. 10-11, Jacob Wunch; Lock No. 12, John Baussum; Lock No. 13, ——; Lock No. 14, Wm. H. Gibson; Lock No. 15, John Hendricks; Lock No. 16, George Bolton; Lock No. 17, John Hauk; Lock No. 18, Tobias Wagner; Lock No. 19, Moses Betz; Lock No. 20, Daniel Heim; Lock No. 21, Michael Newman; Lock No. 22, Frederick Young.

ing known as the Navigation Building, in which were grouped the offices of the different canal officials. Standing on an elevation overlooking the landings and the dam below, and surrounded by trees and grass plots, it was a scene of great beauty as well as industry. On the lawn in front of the building religious services were conducted occasionally on a Sunday afternoon, by Rev. Joseph H. Schreiner, who for seven or eight years devoted his time to missionary work among the boatmen, traveling up and down along the canal, holding services and distributing tracts.

Immediately to the west of Bausman's lock were the largest and most extensive docks and landings owned by the company. The main portion of the dock, known as the Lippincott dock, was opened in 1853, and, as stated by Mr. Smith, had 3000 feet of frontage. There was also another section, further south, known as the "old dock," which was of considerable size. These landings were the busiest spot on the canal. They were elevated about fifteen feet above the surface of the water, and on them the cars were shifted to and fro by means of locomotives and mules, and placed into position over the chutes which guided their contents into the boats below. There were chutes sufficient to enable about ten or twelve boats to be loaded at the same time, there being two chutes at each loading place. As the coal passed into the boats it ran over a screen, and the fine material which passed through the screen was taken away and deposited in large piles near the present base ball ground and along the river below the railroad bridge. A covered bridge extended from a portion of the landings, across the entrance to the dock, to lock No. 12. This bridge was blown from its abutments during a storm in 1889. These docks were situated at the head of dam No. 7, which stood at St. John Street. This dam, of course, was constructed across the natural channel of the river. To divert from it and the dock system floods and other surplus water, and also accumulations of coal dirt and sand, a channel was cut, about 1858, through what is now the west ward of the

borough, commencing at a point in the river above the docks and discharging into the main stream below the dam. This cut-off has but recently been closed up, so that the full volume of the river now flows in its original channel.

Before the enlargement of the canal and the erection of the docks just described, boats were loaded at a number of docks occupying the site of the present base ball ground and extending up around the bend of the river. A map on file at the court house, dated 1829, shows a series of docks, twenty-five in number, constructed at right angles to the channel of the river, from the breast of the dam to a point beyond the Broadway bridge. Coal was brought down the Mine Hill railroad to its terminus at these docks, and here loaded into boats. The circular railroad embankment still remains. Part of the fence surrounding the ball ground is erected on it, and it forms a convenient elevation for viewing base ball games. The towpath along this dam ran on the eastern side, at the base of a high wall which protected the adjoining streets and alleys.

A great deal of the life of Schuylkill Haven centered around the dam. Along the berme bank boats were tied up three or four abreast, awaiting their turns to be loaded. Its waters were a favorite swimming place on hot summer evenings. Swimming matches, tub races and other aquatic sports were held here on holidays. Rowboats passed up and down. Occasionally in winter the water would not be drawn off for a time, and there was skating, and ice was harvested.

Below dam No. 7 was the Canal Street level, entered through a guard lock which now lies buried beneath the gardens to the rear of the First National Bank and the other buildings between St. John Street and the railroad. Below the railroad this level was crossed by two bridges, one at Main Street and the other at Columbia Street. The weigh-lock stood on the western bank, near the Main Street bridge, in the early days of the canal. Here the boats and their cargoes were weighed. They were

A View of Schuylkill Haven, Showing the Navigation Building, Lock No. 12, the Spring Garden Level, and a Portion of the Lippincott Dock, as They Appeared in 1902.

floated into a dock or basin, and when the water was drained off they rested on a large scale. The method was, no doubt, similar to that now in use on the Lehigh Canal, a short distance below Mauch Chunk. The weighing of boats was discontinued after the enlargement of the canal, it probably being impracticable to weigh the large and heavy boats which then came into use. Later on this site was used for a boatyard, which was conducted by different persons, the last of whom was Michael Shadel, who still lives in Schuylkill Haven. This yard was closed in 1883; its site is now occupied by a knitting mill. On the west side of the canal, the entire square between Main and Union Streets was taken up by the Navigation Company's harness and blacksmith shops, a large barn, and an enclosure known as the mule yard, where mules temporarily off duty were quartered. The large, yellow barn, or "company stable," as it was called, was destroyed by fire in July, 1887, and a number of mules and horses perished.

At the foot of Canal Street was lock No. 14, known to the writer as Geiger's locks. The last locktender here was Alonzo Richards, who was preceded by Alexander Geiger. The last locktender at guard lock No. 13 was Christian Reichert, and at lock No. 15, Thomas Miller. Mr. Reichert and Mr. Richards are still living in Schuylkill Haven. Below lock 14 was the rope factory mentioned by Mr. Paxson in his interesting "Reminiscences of Schuylkill Haven;" also a repair yard for boats, and further down, around the bend, the boatyard which was last in operation above Port Clinton. This yard was then conducted by Francis E. Warner, and boats were built here during the last year the canal was in operation—1888. In fact, the last boat to pass from Schuylkill Haven to Port Clinton was a new "river boat," which had just been launched at this yard. This information was furnished by Daniel Warner, who worked at the yard at the time.

Leaving Schuylkill Haven and its many features connected with the canal, the boats passed through several dams and levels to Landingville. At lock No. 15, the head of Bowen's dam, the mules were taken across

the river by a ferry in the early days of the canal. Later a bridge was built, and in winter ice was cut on what is called the Red Pond, and taken across this bridge and up the towpath to the town. Below the railroad bridge crossing Bowen's dam was the "company farm," a large and fertile tract of land owned by the Navigation Company. Its lowlands have now been entirely destroyed by coal dirt. The level above lock No. 17 is now covered by the large culm bank deposited from the storage yard. At Landingville, on the east side of the road leading to Adamsdale, was Deibert's boatyard. On the berme bank of the Landingville level was a lime kiln, at which the "chunkers" (boats built in two separate sections) unloaded.

In connection with the canal at Landingville, a quotation from the autobiography of Daniel Deibert, who died in Schuylkill Haven in 1890, aged eighty-eight years, is of interest. He says: "I moved (about 1830) to Landingville and tended the guardlock at the canal. I also kept a ferry boat for taking passengers over the Schuylkill. There was no bridge that time. Once I was in danger. The water was very high. I had ten passengers to take over. We came safe over, but landed far down on the other side. Once I got very sick, but it was my own fault. After a thunder shower I waded into the Schuylkill to get out a fish net. I was tending the guard lock, and boats were coming, and had no time to put dry clothes on, and that gave me my sickness." Later Mr. Deibert conducted a blacksmith shop and made ironwork for the boat builders, and he says, "My wife often helped me split iron to make spikes for boats."

Below Landingville was dam No. 11. This dam figured in a damage suit in 1864. By reason of coal dirt washing into it, the Navigation Company was obliged to put flashboards on the breast of the dam in order to get sufficient depth of water. This raised the level of the dam and flooded the adjoining fields of Morgan W. Fehr, who brought suit against the company. Dam No. 11 had its outlet into the upper level of the Tunnel Canal, which was very wide at the upper end, then contracted

to a width permitting only one boat to pass at a time, where it led through the tunnel (described by Mr. Smith as the first tunnel in the United States), and ended at lock No. 20, about a quarter of a mile below. This level and the one below are some of the few which have, by reason of their location, escaped being filled with coal dirt washed in from the river by floods, and the water that remains in them is well stocked with fish.

Lock No. 20 was placed some distance away from the one that it superseded, and there is still standing the upper end of the old brownstone lock erected in the thirties. It is one of those pieces of work described by Mr. Smith as the best stone masonry in Pennsylvania. On the berme bank of the lower tunnel level was a stone quarry, from which material was taken for canal walls and repairs. This is the widest level above Reading. Its outlet dock differs from all the others above it, in that its walls are not the usual rough stone walls, lined with planking, but are composed of square-cut brownstone block, close fitting and even jointed, without wooden lining. They were, no doubt, taken from the smaller cut stone locks which the new locks replaced. The tail gates of this lock admitted northbound boats from dam No. 12, which is of considerable length, having its breast at Auburn. Below it is the short Auburn level, on the west bank of which was a repair yard, with drydock. Below this level the canal shifted, through a dam known as the Crosscut or Scotchman's dam, to the eastern bank of the river. Passing through another short level, the boats entered dam No. 14, called Lord's dam, which is the one at Stony Creek. The fall in the river here is not as abrupt as above, the dam having a length of two miles. There is one level, called Rishel's canal, between it and the next dam below. Then comes Hummel's dam, followed by one level, which terminates a short distance above the Port Clinton dock, the present head of navigation. Lord's dam and Hummel's dam are still being maintained by the company, as dirt catchers, and they are the only dams now standing in the river above Port Clinton. These two dams were torn out by

the floods of December, 1901, and February, 1902, but were rebuilt within the next two years. The stone work of their locks was taken down and used in the reconstruction.

The dock at Port Clinton is the smallest of the docks on the canal, but amply large enough to accommodate the present traffic. There is but one chute used for loading the boats. This dock and a portion of the dam below are the only sections of the canal now in operation in Schuylkill County. It is at the head of the Blue Mountain dam, which has a length of about two miles and is the highest dam on the river, its breast being twenty-five feet high. On its bank, near the railroad tunnel, is a large white rock, called Pulpit Rock. Against this rock a boat was hurled and sunk by high water many years ago, and the captain's daughter drowned in the cabin. Near the dock the waters from the Little Schuylkill enter the dam. The towpath bridge which formerly crossed the Little Schuylkill was carried away in the flood of 1901, and has not been replaced. Boats leaving the dock are poled a short distance to a point where a towline can be thrown out to the towpath, and from there they are towed by mules.

Having reached the end of the abandoned sections of the canal, we will turn aside to a consideration of such matters of interest as are found in the lease by which the canal passed under the control of the Philadelphia and Reading Railroad Company. This instrument is dated July 12, 1870, two years prior to the abandonment from Port Carbon to Schuylkill Haven. It covers seventy-three pages of the deed book in which it is recorded at the court house, of which sixty are devoted to schedules listing in detail all the real and personal property owned by the Navigation Company. The schedule of real estate includes not only every piece of ground occupied by the channel of the canal from Port Carbon to Philadelphia, but numerous tracts and lots for reservoir sites, lock houses, coal dirt dams on the different branches of the river ,farms, quarries, etc. The first tract on the list is that now covered by the Silver Creek dam, several

Dock at Port Clinton

miles above New Philadelphia, and the last is a tract of forty-two acres at the mouth of Crum Creek, Delaware County, "for a winter harbor for canal boats."

The lease is for the term of 999 years. Under the first clause, the lessee is permitted "to discontinue the use for canal purposes or water power purposes, of the canal above the division known as the Hamburg Canal, if, in their opinion, the productive value of the other demised premises would be greater after such discontinuance than before." The annual rental was fixed at $655,000. Methods were provided by which this rental could be reduced from time to time.

The most interesting section of the lease, however, is the schedule of boats. Here is given a list of 634 boats, together with their numbers and names. Those of us to whom the canal was at one time a living reality, will find little difficulty in picturing this mighty fleet in our minds. Placed end to end, in single file, it would have extended twelve miles, or one-ninth of the entire length of the canal. Spaced evenly throughout the distance between Port Carbon and Philadelphia, there would have been six boats to the mile. The entire fleet had a capacity of more than one hundred thousand tons. And yet, presumably, this comprised only what were known as "company boats," and did not include other hundreds of boats owned by individual boatmen. In the list of names of boats, we catch a glimpse of the character and temperament of the men who manned the fleet, and the times in which they lived. The Civil War, then not long ended, is recalled by such names as "General Grant," "General Banks," "General Joe Hooker," "General Sherman," "Major Anderson," "Gettysburg" and "Appomattox." The States of the Union are represented by the boats "Ohio," "Delaware," "Vermont," and others. Citizens of this community were thus honored. The boats "Charles Baber," "John Rickson," "Harvey G. Field," "William McDonald," "Albert Hesser," "Horace Royer," "James Kirkpatrick," "C. V. B. Deibert," "Z. T. Galt," "John W. Forney," "Baird Snyder," "Henry Allison," "Charles Hesser,"

and "D. J. Harner" passed and repassed on their various voyages. "Hard Times," "Revenue," and "Jay Cooke" took their turns at the landings. Family ties were reflected in the "Cousin John," the "Twin Brothers," the "Twin Daughters," the "Four Brothers" and the "Pleasant Home." "Sam," "Mary," "Lizzie," "Little Annie," and "Little Fannie" were one branch of the great family. There were a "Here I Am," a "Schuylkill Mountain," a "Morning Glory," an "Ironclad," a "Tornado," a "Blooming Youth," a "Celestial Empire," a "Hippopotamus," a "War Eagle," a "Sparrow," a "Gazelle," a "Rover," a "Wanderer," a "Restless," a "Night Owl," an "Eden," and a "Big Potato." "St. John," "Napoleon" and "Isaac Newton" were there. The "Gay and Happy" spoke of a care-free life, and the "Golden Rule" was not forgotten.

The extent of the works necessary to maintain this large fleet in working order is indicated by the succeeding schedules. There were tool houses at Gordon and Mahanoy Plane, machine shops and foundries at Reading, car shops at Port Carbon, Mount Carbon, Schuylkill Haven and Port Clinton; stables and harness shops at different places along the line; dredging machines, mud scows and steam tugs; a complete telegraph line, with its batteries, poles, wires and linemen's equipment; a railroad and landing system, with three locomotives, over 3,000 coal cars and a wreck car; a vast amount of lumber, from the heavy oak timber for lock gates to the white pine decking for the boats; a bewildering assortment of metal for locks, dams and boats; hundreds of mules, together with their many pieces of harness; towlines, poles, etc.

To sum it up, a reading of the lease impresses one with the immensity of this canal system, and suggests the question, which has not been satisfactorily answered, as to why it has been allowed to dwindle to practically nothing, so far as its operation is concerned; for at the present time there are, and, for the greater portion of the time since the abandonment to Port Clinton, have been, only between thirty and forty boats in use, as compared

with 1400 in 1859, when 1,372,000 tons of coal were carried.* Some of these are boats that formerly ran to Schuylkill Haven and have been rebuilt and repaired from time to time at the yard at Reading. Others are boats formerly used on the Pennsylvania Canal, running through Harrisburg, which was abandoned in 1901.

The writer was but a small boy at the time of the abandonment of the canal from Schuylkill Haven to Port Clinton, and his recollections of the same are confined principally to that section extending through Schuylkill Haven. Here the canal was seen at its best and busiest. Standing on the railroad bridge near the P. & R. depot, and looking east, dam No. 7 and lock No. 13 were in the foreground. The river, in crystal clearness, flowed over the pebbly bottom, as yet nearly free from large accumulations of coal dirt. Here and there a deep hole in the river bottom furnished a swimming pool for the boys. Below the bridge, an island, with large, leafy trees, afforded a playground on which many happy hours were spent. On the dam a large number of empty boats were tied up along what is now the base ball ground, awaiting their turns to proceed up to the dock to be loaded. Along the eastern bank of the Canal Street level, from Main Street down to the lock, was another line of light boats. At frequent intervals a loaded boat was poled out of the dock. Then a towline was thrown from the deck to the towpath and hooked to the harness of the mules, and presently the voyage was begun. The last traces of dust and dirt were washed from the deck, the captain was at the tiller, and, if it were near meal time, the housewife was preparing the meal on the little stove carried on deck.

*In the case of Philadelphia and Reading Railroad Co. vs. Reading and Pottsville Railroad Co., Mr. E. F. Smith, Superintendent of the Schuylkill Canal, testified on March 11, 1885, as follows:

"Q.—The working of the canal in the Schuylkill Valley is not profitable?

A.—Well, comparatively it is not profitable, but actually, or as a question of transportation, it is more profitable than the railroad. The figures of the Schuylkill Canal itself show a lower percentage of working expenses to gross receipts than any railroad in the country."

The loaded boats made slow, but steady, progress. Three mules, hitched tandem, were the motive power, and the speed made was not much more than two miles an hour. But the boats ran day and night, and a round trip from Schuylkill Haven to Philadelphia and return could be made in less than a week, the return trip, of course, taking much less time than the trip with cargo. Sunday was a day of rest, and no boats were passed through the locks, except toward the close of the season, when the near approach of freezing weather necessitated getting the coal to market as soon as possible. Occasionally an early cold snap would catch boats in transit and they had to wait until the ice was broken before they could proceed, or, perhaps, remain where they were until spring, as witness the following item from the Pottsville Chronicle, under date of December 6, 1886:

"About thirty-five canal boats are frozen in at Manayunk and sixteen at Bridgeport. Navigation has closed unexpectedly early, although preparations were being made for it."

The mules were kept at their work by a driver, who frequently was quite skillful in the use of those hard names and epithets which, on the canal, were supposed to be most effective in developing mule power and applying it to the propulsion of canal boats. Little bells were attached to the harness, making a pleasant, tinkling sound. When a boat was met coming in the opposite direction, the mules drawing the loaded boat were stopped and the towline allowed to slacken up and sink beneath the surface of the water. The mules drawing the approaching boat stepped over the end of the line resting on the towpath, and the boat floated over the sunken line, between the towpath and the loaded boat. This operation over, the slack line was again drawn up and the voyage resumed. Here and there the towpath shifted from one side of the canal to the other, and this was done by means of what was known as a "winding bridge." Every bridge was provided with rope guards, which prevented the rope from catching in any obstruction.

The "Bruce," in Blue Mountain Dam

Several hundred yards from each lock, the boatman sounded a horn, which was usually a large sea shell, known as a conch. The locktender, thus warned, was given time to prepare his lock for the entry of the boat. If a southbound boat were approaching, the lower gates were closed, the lock filled with water, and the upper gates opened. At a prescribed distance away from the lock, the mules were halted, the line drawn on board, and the boat floated into the lock of its own momentum, skillfully guided by the man at the tiller, who endeavored to bring his boat in exact line with the lock, so that there might be no unnecessary bumping or straining. The boat was brought to a dead stop by means of ropes thrown around snubbing posts on the edge of the lock, the other end being loosely fastened to the cleats on the boat. As soon as the boat had entered the lock, the upper gates were closed, the lower wickets opened, and the boat quickly sank to the lower level, and when the lower gates were opened it was "swelled" out by means of a current created by partly opening the upper wickets. The line was then again thrown to the towpath, hooked up, and the same processes repeated through each level, lock and dam, until tidewater was reached.

Each level was provided with a spillway, over which surplus water escaped and found its way into the channel of the river. Along the berme bank, at many places, were large trees, with benches beneath them.

Canal Street, Schuylkill Haven, was a very pleasant location. From their homes and porches the residents viewed the traffic passing up and down, and in the long summer evenings rowboats passed back and forth, their occupants, perhaps, singing. As evening came on, the boatmen on the boats which had been tied up during the day, drew water from the canal with buckets to which ropes were attached, and threw it over the decks, and with paddles splashed the sides, to counteract the drying out caused by the hot sun of the day. At the Columbia Street bridge the big boys dived from the top of the

bridge and swam in the water beneath, with shouting and laughter. Once in a while a boat returned from Philadelphia with a load of watermelons and tied up along Canal Street, where the melons were sold at as low as ten cents apiece.

When navigation closed for the winter, it was customary to open the dams and draw off the levels. Usually a thick coating of ice had formed before this was done, and when the water was drawn off, this ice cracked into huge cakes, which lined the sides of the canal channel until spring. In the center of the channel a narrow stream flowed, which froze and furnished a little skating. Once in a while ice was harvested on the canal before the water was withdrawn.

The canal had its pleasures—and likewise its sorrows, not only for those who worked on it, but for those who lived nearby. A driver badly injured by the kick of a mule; another boy with his leg crushed by a boat in a lock; a little child drowned in front of his home on Canal Street; a suicide's body recovered from beneath a dredging machine; a father found drowned in the lock at Landingville; a boatman hurled from his boat and drowned by a sudden current catching the rudder and swinging the tiller violently against him—these are a few tragic incidents, and the list could be augmented indefinitely.

One of the traditions of the canal is that the first boat was built at Orwigsburg and hauled to Schuylkill Haven, where it was launched. It was, no doubt, a small affair, compared with which the large boats built in the latter years were Titanics in size. The construction and maintenance of the large number of boats used gave rise to the industry of boat building, which was a branch of carpentry requiring special skill. Boatyards were maintained both by the Navigation Company and by individuals, throughout the entire history of the canal. Most of them were situated at Schuylkill Haven and Landingville. Here boats were built and repaired, and throughout the long summer days the air was vibrant with the sound of spikes and rivets being driven into place, and of the saw and caulking mallet.

The writer has a very distinct recollection of two summers (1887 and 1888) of boyhood play spent at the Warner boatyard in Schuylkill Haven. How interesting it was to watch the process of building a boat. First the false keel, nearly a hundred feet long, was laid on blocks raised several feet above the ground, close to and parallel with the water's edge. Then the framework was put up, resembling the skeleton of some monster animal, the floor timbers being braced by a heavy keelson. To these ribs the bottom and side planking and the decking were securely fastened with long spikes. For the purpose of bending the heavy planks to the shape of the bow, they were steamed and made flexible in a tank built for that purpose. All the seams and joints between the planks—bottom, sides and decks—were thoroughly caulked with oakum and filled with pitch. The inside of the boat was braced and lined, the hatches and cabin were constructed, rudder put in place, the capstan and cleats firmly fastened to the deck, and finally the boat was painted a pleasing color and its name placed across the stern, just above the little cabin windows. A touch of red or green here and there added to its appearance. When all this was done, it was ready for launching.

Launching day was a sort of gala day, and there was an unusual stir about the yard. No bottle of wine was broken and no officials of the Navy Department were present, but the boys were there in full force and ladies were "among those present." Unlike an ocean steamship, the boat was launched sideways instead of stern first. In preparing for launching, several heavy, solid, sliding ways of well-greased planking were placed under the boat, sloping from the keel to the water. The boat was then tilted and the supports removed from beneath, until it rested on the ways and was prevented from sliding into the water only by two stout props, one at the bow and the other at the stern, placed against the lowest part of the keel. It was always high tide in the canal, so no special hour need be set for launching. When all was ready, two strong workmen, with sledge hammers, took their positions at bow and stern, and,

having signaled one to the other, immediately struck away the obstructing props simultaneously, and the boat slid rapidly down the greased ways into the water, sending a wave two or three feet high across the surface of the canal to splash and break against the opposite bank. On one or two occasions the writer was on the deck of a boat as it was launched, and he will never forget the sensation as the big hulk commenced to move, in a tilted position, toward the water.

At the individual yards many "river boats," as they were called, were built. These boats were intended for use on the Delaware and Hudson Rivers, New York harbor, and other points, and were much larger than those used regularly on the canal, having a capacity of three hundred tons. They were built of the largest dimensions permitted by the size of the locks and height of bridges, being 100 to 103 feet in length, 17 feet 6 inches wide, and 12 feet high, which was about four feet higher than the boats built for the regular canal trade. So high were they that when towed up to the landings to be loaded, they had to be partly filled with water, which was done by removing a plug in the bottom. This water cargo would cause them to roll like a ship in a storm, and although they had settled considerably in the water, sometimes they had difficulty in passing under the bridges. They made their first and only trip down the canal with a cargo of coal or coal dirt, and after passing into the river at Philadelphia some upper works were built on the deck to fit them for river use.

At the boatyards there was usually one or more dry docks, into which boats were towed for repairs. They were guided into position, and when the water was drained off they rested on blocks at such a height that repairs could easily be made to the bottom.

The abandonment from Schuylkill Haven to Port Clinton seems to have taken place somewhat abruptly. From the Miners' Journal of April 5, 1886, we learn that navigation opened that month, having been delayed by floods, and that the company had decided to build twenty

The "Bird," Northbound, Approaching the Blue Mountain Locks

new boats, some at its Schuylkill Haven yard, and the rest, under contract, at the yards of Francis Warner, at Schuylkill Haven, William Deibert, at Landingville, and John A. Hiester, at Reading. The following month navigation was reported to be "quite brisk." Several of these boats were completed at the company's yard in Schuylkill Haven in the spring of 1887, as before stated. But in the season of 1887, in spite of the building of new boats, we read that only about 150 boats were in use, and these were individual boats, while several hundred company boats were lying idle at various ponits along the canal, and many of the mules had been sent to the mines. In August, 1887, the Receivers of the railroad company asked permission from the United States Court to withdraw these boats from the canal and use them in its business between New York and Elizabethport. This petition was granted. In commenting on this action, the newspapers state that "boating will soon be one of the lost arts. Traffic has decreased to such an extent during the past few years, that but one pilot is required to steer the boats through the rockbound channel between Manayunk and the Falls of the Schuylkill, instead of nine."

However, toward the close of the season of 1887, there was a great demand for coal, and on December 2, 1887, it was stated that from ten to twenty boats per day were being loaded, some at Schuylkill Haven, but the most of them at Port Clinton. But the article also refers to rumors of abandonment, and speaks of the "dreary outlook for the continuance of navigation." These fears were soon realized, for, under date of January 30, 1888, we read in the Miners' Journal, "The Reading Company, lessees of the Schuylkill Canal, have given official notice of the abandonment of the canal from Schuylkill Haven southward to Port Clinton, a distance of twelve miles. This will end Schuylkill Haven's career as a leading point of shipment for anthracite coal, and its docks and extensive wharves are destined for an indefinite term of idleness. All shipments on the canal will be made from Port Clinton in the future."

This action finally and forever ended the shipment of coal from the Schuylkill Haven docks, so that it can be recorded with certainty that no boats were loaded after December, 1887. But though it was probably not known definitely, when navigation closed in 1887, that boats would never again pass under the chutes at the landings, yet Fate seems to have decreed that the last boat loaded should tarry until the following Spring, as though reluctant to leave the harbor to which it had returned periodically for many years, but upon whose waters it and all others of its kind would float no more forever. For this last boat, the "Capt. M. Byrnes"—an old veteran of the canal, and one of the same boats listed in the schedule attached to the lease of 1870—was reserved a special distinction. After being loaded and before it could get under way, the canal was suddenly closed by ice, and the boat lay at the entrance to the dock, just below lock No. 12, throughout the winter. So that when it passed down in the Spring of 1888, in charge of Captain Daniel Cole, of Mt. Carbon, the order for abandonment had by that time been issued, and the boat was then known to be carrying the last cargo of coal ever shipped from Schuylkill Haven by canal.

Following the departure of this boat, the canal was kept open during the season of 1888, but only for the passage of such boats as had been contracted for and were under construction at Warner's boatyard for use on waters other than the canal; and therefore the last boat to pass from Schuylkill Haven to Port Clinton was not (strange as it may seem) one that had, as it were, grown old in the service and with the canal gone to decay, but a brand-new river boat, just entering upon its career. No locktenders were on duty this season, and these new boats, after being taken up into dam No. 7 and loaded with coal dirt near the present base ball ground, so as to lower them in the water, were taken to Port Clinton under the charge of one of the company's employees, who attended to the locking. The exact date when this last boat went down the canal is uncertain, but it was late in the summer or fall of 1888, and thereafter the locks were closed forever.

The abandonment of the canal was regarded as a great calamity, and dire things were prophesied; but the communities affected soon adjusted themselves to the new order. A few of the boatmen have continued on the canal below Port Clinton until this time. The rest found other employment. Some, who had accumulated a little capital, made business ventures which, as a rule, proved successful. Different industries were started. Schuylkill Haven's career as a manufacturing town dates from the closing of the canal, and many of her prosperous citizens were formerly boatmen.

Having attempted a description of the canal when it was in operation, I shall take up the changes which ensued upon its abandonment. As heretofore stated, the shipment of coal from Port Carbon ceased in 1853, and from Palo Alto and Mount Carbon in 1872. Decay and ruin set in at once. Gradually the dams became filled with coal dirt and other refuse. The damage caused by floods was not repaired. Towpath and lock bridges were removed. Lock gates and the plank lining of locks fell to pieces or were destroyed by fire, and in a short time the towpath and those levels that had been drained were covered with trees and bushes. A few of the lockhouses have been kept in repair to this date and rented to tenants.

Dam No. 1 was torn out in 1874, at the request of property owners of Port Carbon; No. 2 about the same time. No. 3, at Mount Carbon, remained in place about ten years longer. Nos. 4 and 5 were removed on November 22 and 26, 1894. No. 6, at Seven Stars, was destroyed by a flood on May 21, 1894. No. 7, at Schuylkill Haven, was torn out on September 14, 1895; No. 8, in 1892, and 9, 10, 11 and 12 about the same time. No. 13 was still in place in 1898, but was taken out not long thereafter; and, as before stated, 14 and 15 are still being kept up. All of the thirteen dams, except No. 6, were removed by workmen employed by the company.

Although the shipment of coal from points above Schuylkill Haven ceased in 1872, it is said that cargoes of ore were carried by boat to the Atkins furnace in Pottsville for a year or two later, but no locktenders

were on duty. After that, until the abandonment from Schuylkill Haven to Port Clinton, some of the levels were used as storage reservoirs, in addition to the Tumbling Run dams, the waters from which were drawn upon in dry seasons to float the boats from Schuylkill Haven. The third Greenwood level, the Mount Carbon level, and the Waterloo level were thus utilized, and it was testified in the litigation between the Philadelphia and Reading Railroad Company and the Reading and Pottsville Railroad Company, at the time the Pennsylvania railroad was built, that such use was necessary, and, without it, serious inconvenience would be occasioned in moving the trade from Schuylkill Haven during times of drought; that the Tumbling Run reservoirs were occasionally exhausted, and without the water in these levels the boats would be unable to leave Schuylkill Haven. The levels were allowed to fill at night and were drained during the day. The Five Locks and the Waterloo level were also kept open for boating purposes until 1883, to enable lime boats to reach a kiln near Seven Stars.

In the litigation mentioned, the railroad company, lessee of the canal, denied that it had abandoned the canal above Schuylkill Haven. Whether it would so contend at this time is a question that we are not concerned with. Certain it is that the use of the canal for navigation has been abandoned above Port Clinton, and it is equally certain that it would be practically impossible to re-open and operate it unless the entire river channel were cleared of the millions of tons of coal dirt which block it.

A great deal of the canal property has been taken and occupied by the railroad company for its purposes, and some of it has been sold or leased to individuals. The landings at Schuylkill Haven are now occupied by the car shops and railroad sidings, and the dock and level above lock No. 12 are gradually being filled with the debris from the shops. At many places the railroad embankment has been extended so as to cover the towpath and portions of the canal channel. Within the past few weeks lock No. 8 has been buried from view.

The process of washing culm banks at the mines, which came into use about 1890, and the discharge of the refuse and black water into the river, hastened the ruin of the canal works and destroyed hundreds of acres of valuable land for many miles along the river. In 1890 the river last ran clear between Pottsville and Port Clinton. Since then its waters have been black and filthy, except during such periods as mining was entirely suspended; and the diversion of flood waters from their natural channel has torn away canal embankments and worked such devastation that little is left except the massive lock walls. Where a crystal stream once flowed, bordered by fertile farm land and pretty homes, black filth now exists. Deep river channels, over which towering trees drooped their branches, have been blocked with from six to eight feet of dirt, the river has cut a new course at different points, and the trees have died and fallen. The old swimming holes have been filled up, and the grassy, shady islands, on which the boys played for generations, have been mingled in the desolation caused by modern methods of preparing coal.

The coal dirt nuisance along all streams draining mining territory has become so great and led to such a large amount of litigation within recent years, that it may be well to refer to it with reference to its effect on the operation of the canal. From the early days of mining, a steadily increasing quantity of refuse was carried away by the streams from the piles of culm deposited on their banks. As we have already seen, the dam at Port Carbon was abandoned as early as 1853 on this account. Some of the efforts made to overcome the evil are referred to by Mr. Robert Allison, in his paper read April 24, 1912. During the maintenance of navigation above Port Clinton, however, no trouble from this source was experienced below dam No. 13, at Auburn. Above that point the channel was kept open to the required depth by means of dredging, and along the banks of the canal large piles of dirt and sand taken from the dams may be seen to this day. In 1864 five dredging machines and twenty to fifty men were em-

ployed at this work, and the labor was double what it was in 1850. The work was usually done in the spring. Below Auburn, practically no dredging for coal dirt was ever done prior to 1888. None had been done in the Blue Mountain dam at Port Clinton for twenty years. It was very seldom that navigation above Port Clinton was interrupted from this cause, after the accumulations of the winter were removed, and boating was carried on for nearly nine months out of the twelve. Since 1888 constant warfare has been waged at Port Clinton. The channel in the Blue Mountain dam is kept open with difficulty, and dredging for coal dirt is done to points below Reading. In the ten years from 1888 to 1898, 300,000 cubic yards of material were dredged from the Blue Mountain dam. Each year the opening of navigation is delayed, sometimes until late in April or early in May, until the channel can be opened at Port Clinton, and each little rise in the river necessitates a repetition of the work. Whether the company can successfully contend against this obstacle in the years to come, is an open question. Already coal dirt has been deposited on the river banks far below Pottstown, and its black traces may even be seen at times near Fairmount Park, Philadelphia.

In addition to dredging, a large number of low dams were built on all the streams feeding the Schuylkill, in order to catch the dirt and prevent it from getting into the canal channel. The remains of these dams may still be seen on the West Branch and the Mill Creek. As the dirt accumulated it was removed from the dams and deposited on the banks of the streams.

The filling of the river bed and dams with coal dirt has brought about a new industry. From Schuylkill Haven to Felix's dam, a few miles above Reading, there are a number of coal washeries erected on floats or rafts in the river, and by means of these devices hundreds of tons of the smallest sizes of coal are taken from the river and used by various manufacturing plants for steam purposes. At Port Clinton the coal taken from the Blue Mountain dam is loaded on a scow,

Lock No. 7, 40 Years After Abandonment

which is towed by a rudely constructed stern wheel steamer to Hamburg. The same is true of the coal taken from Felix's dam, which is deposited several miles from where it is recovered from the river. Coal was taken from this dam in this manner as early as 1905. Thus the material allowed to go to waste at the mines, from ten to twenty and more miles away, has proved to be of some benefit, in spite of the ruin it has caused.

But we must bring our lengthy paper to a close. The subject is an interesting one, and much more could be said upon it. The canal, as we knew it years ago, now exists only in memory. Here and there along the river may still be seen, uncovered by a shifting of the current, portions of boats that sank many years ago and were afterwards buried by coal dirt. Near the Schuylkill Haven docks several boats are still buried out of sight, and above the surface of the water in the old dock protrudes a piece of bow-iron, telling of the sunken hulk beneath. In the river bed right above the Palo Alto bridge, near the hospital, and below the Black Bridge at Mount Carbon, lie sections of the bottoms of boats. At places the timber cribbing of private wharves may be seen, but the wharves have waited in vain these many years for boats to tie up beside them and discharge or receive their cargoes. The abandoned locks stand like monuments over a gigantic grave, and the march of events that gradually destroys them seems akin to desecration. No more are heard the rush of water as a lock is being filled; the roar of floods tumbling over the dam-breasts; the rattle of coal passing through the chutes into the boats; the musical sound of the boatman's horn echoing among the hills; the sharp clatter of hoofs as the mules crossed a bridge; the tinkle of the bells; the call of the driver to the mules, and the gentle lapping of the tiny waves feebly opposing the progress of the boats. No more are seen the levels and dams filled with crystal water; the idle boats tied up in the shade of the trees; the boats in transit rising and falling in the locks; the plodding mules; the barefoot driver boys; the occasional steam tug, raising what seemed to

be a huge wave in its progress; the dredging machines, scooping up mud and coal dirt; the scows; the rowboats, and the boatyards. All these are now but pleasant memories, and, while we deplore their passing, we know that many of the boatmen have since prospered far more than they would have otherwise, and the communities through which the canal passed, forced to seek other industries, have in the end been greatly benefited by their own exertions.

Steam canal boat. At the machine works of T. H. W ntersteen at Port Carbon there is a canal boat in which are being placed a boiler and engine for its propulsion by steam. The boat was built at Reading and will carry, independent of machinery and coal for the engine, 150 tons freight, besides being able to tow one or more boats. The engine is 20 horse power. Potts. Journal, 13 Aug. 1874

This fragment is from a Reading newspaper—

NG, OCTOBER 31, 1874.

The Schuylkill Canal.

Its Former Greatness and Possible Future—Its Present Annual Capacity Nearly 2,000,000 Tons.

The present may be called the railroad era, and the public eye has become so accustomed to seeing constantly in the press of the country, discussions of railway projects, glorifications over railroad successes, and latterly, lamentations over railroad failures and shortcomings, as well in trade as in interest advertisements of the most alluring character offering railroad bonds for sale to a strangely confidential people, stories of struggles between railroads and "Grangers" in the west and anti-monopolists in the east, of railway intrigues at Washington and at the capital of every State in the Union, that the old-fashioned canal of the days of our grandfathers has been almost entirely forgotten.

Unlike its rival, the railroad, it makes no show in the newspapers, as it makes no noise in the quiet conduct of its business. The locomotive with its appendant train rushes over the iron way with a rattle and racket, with a roar and a scream, that compel attention as it passes like a flash through quiet country or bustling town. The slow barge slips lazily yet surely onward to its journey's end, making scarce a ripple on the glassy surface of its watery roadway as it moves noiselessly by, and yet carries in its capacious hold half as large a tonnage drawn by its trio of patient mules, as its shrieking, thundering rival with its hundred rattling cars.

The canal is the oldest of all artificial structures designed to facilitate the movement of heavy products between distant points, and it has not yet been proved that it is not the best as it certainly is the cheapest; it even now maintains itself against its modern rival, the railroad, when it is necessary that very large bodies of freight should be moved from the producing regions to the seaboard markets.

Perhaps you think that the Schuylkill Canal was quite literally an old slack-water stick-in-the mud. In reality, County servicemen might be very glad today were there an industry of like size to come home to.

Not only were there 1400 canal boats, at one time, but "There were tool houses at Gordon and Mahanoy Plane; machine shops and foundries at Reading car shops at Port Carbon, Mount Carbon, Schuylkill Haven and Port Clinton; stable and harness shops at different places along the line; dredging machines, mud scows, and steam tugs; a complete telegraph line with its batteries, poles, wires and lineman's equipment; a railroad and landing system with three locomotives, over 3,000 coal cars and a wreck car; a vast amount of lumber, from the heavy oak timber for lock gates to the white pine decking for the boats; a bewildering assortment of metal for lock, dams and boats; hundreds of miles, together with their many pieces of harness, towlines, poles, etc."

And now they say that mopping up the dirty old Schuylkill is going to remove the last vestige of this once mighty industry.

That some hearts are still loyal to it is proved by a forth-coming book on the subject, and by Nick Bervinchak's saying that of all his etchings that of the Port Clinton Locks has sold in greatest numbers.

TWO CANAL BOATS FOR SALE.

Will positively be sold at Public Sale, On the 15th of September, inst. at 2 o'clock in the afternoon, at the public house of David Goodfellow, at the Schuylkill Canal, the superior Boat *Lewis Reese*, and the Union Canal Boat *Elizabeth*, both in good order, together with one first rate Mule, and one Horse, and many other requisites for boats. For further particulars inquire at the store of W. & I. Eckert, Reading, Pa.

C. N. Eckert & Co.

16-3

September 1.

Source & date { unknown

rom
per
1874.

Perhaps you think that the Schuylkill Canal was quite literally an old slack-water stick-in-the mud.

In reality, County servicemen might be very glad today were there an industry of like size to come home to.

Not only were there 1400 canal boats, at one time, but "There were tool houses at Gordon and Mahanoy Plane; machine shops and foundries at Reading car shops at Port Carbon, Mount Carbon, Schuylkill Haven and Port Clinton; stable and harness shops at different places along the line; dredging machines, mud scows, and steam tugs; a complete telegraph line with its batteries, poles, wires and lineman's equipment; a railroad and landing system with three locomotives, over 3,000 coal cars and a wreck car; a vast amount of lumber, from the heavy oak timber for lock gates to the white pine decking for the boats; a bewildering assortment of metal for lock, dams and boats; hundreds of miles, together with their many pieces of harness, towlines, poles, etc."

And now they say that mopping up the dirty old Schuylkill is going to remove the last vestige of this once mighty industry.

That some hearts are still loyal to it is proved by a forth-coming book on the subject, and by Nick Bervinchak's saying that of all his etchings that of the Port Clinton Locks has sold in greatest numbers.

The present capacity of the Schuylkill Canal is from 1,500,000 to 2,000,000 of tons annually, but by doubling the locks lengthwise so as to permit the use of steam economically, its capacity could be more than doubled, so that it is easily seen how great an assistance it must be to the railroad when the public demand for coal shall exceed the facilities of the latter for transportation.

The boat stock is kept up by the addition of new barges to take the place of those which time or accident have rendered unfit for service and the whole canal whether bed, banks or mechanical structure, is constantly preserved in a state of efficient repair.

This season the work was ready for the water by the first of March, the winter repairs having been by that time completed; and the last boat-load of coal reached Philadelphia a little after Christmas under favor of unusually mild weather. During the interval between now and the Spring resumption of busi- as the works may need

TWO CANAL BOATS
FOR SALE.

Will positively be sold at Public Sale,
On the 15th of September, inst. at 2 o'clock in the afternoon, at the public house of David Goodfellow, at the Schuylkill Canal, the superior Boat *Lewis Reed*, and the Union Canal Boat *Elizabeth*, both in good order, together with one first rate Mule, and one Horse, and many other requisites for boats. For further particulars inquire at the store of W. & I. Eckert & Co. ...ing Pa.
...ember 1. C. N. Eckert & Co.
16-3

Source & date } unknown

Haven Druggist, Hugh Nelson

Coxe advanced the money, allowing Schaeffer to pay it off as the boat earned its way. For this reason he named it, out of gratitude, for Coxe's favorite pet, his dog Duke.

The other he named the William Washington--because he didn't want to name it George! This boat lived up to the patriotic second part of its name and died a hero's death on the Potomac during the Civil War. On government contract, it had taken down a load of hay for the horses of the Northern army, caught fire, and burned on that river. Nowadays we would think of sabotage.

At first Schaeffer had but one team for the two boats. He would give them a day's rest between trips, leave the empty boat behind and start off with the full one.

By the time of his return one of his children, a 14 year old boy, would have loaded the idle boat with coal at Bausom's lock, at either shute 9, 10, 11, or 12. George Schaeffer was but 9 years old when he began to work with his father on the canal.

The mother and some of the children also went with the boat. Not only had the elder Schaeffer 12 children of his own, but also a little girl he adopted.

From New York he brought back molding sand, part of which he sold in Philadelphia and the remainer to the mills in Reading.

In the summer, when he took his boat to Philadelphia, he'd send a post-card ahead to a man named Scott, on Reddy's Island in the Delware. When Schaeffer tied up at the foot of Chestnut St. Scott would be on the lookout and send row-boats across filled with peaches or baskets of sweet potatoes. Cantaloupes and water melons also came from Philadelphia, and though he might start with as many as 2,000 melons, customers would be waiting for him at every lock and feeding-place on the way home. "Mr. Schaeffer, what have you got this time?" They'd ask. "Punkins", was his jovial reply, and he'd be lucky to have 6 melons left by the time he reached Schuylkill Haven. The fact that he bought the melons for but 10 cents in the city and sold them for a quarter e ch, all the way up, accounts for Mr. Coxe being paid off so promptly.

Incidents George Schaeffer remembers are that when they were stripling s he and one of his brothers took down the boat alone. For some reason this brother had an inordinate fondness for vinegar, and b the time they reached Lees port he had not only drunk all the boat's sup ly of vinegar, but had made himself too sleepy to do his share of the work, because of his "vinegar jag".

He also remembered the boat

which took to dry land near Birdsboro.

On one side of the canal was the reinforced "berm", on the other the weaker towpath bank, in this case one which had been weakened still further by seepage through a muskrat's tunnel. When the boat ran into this frail section of bank the water came pouring through and the boat rode the overflow right out into a field. After the bank was repaired all the coal had to be hauled by wheelbarrow to another back boat.

Something called an etwe dock (aquaduct) was on the tow-path side to guard against crumbling banks when the water was too high. This was not a spillway, exactly, but a sort of cascade or sheet of water through which the mules had to wade, as Mr. Schaeffer describes it.

Mrs. Sara Garretson Bechtel says that when her grandparents, Judge and Mrs. William Donaldson moved to Pottsville from Danville in 1851, the family made the trip of 55 miles or so over the mountains by horse and carriage. Their large store of household goods, however, had to be sent through by canal. The family drove through in a matter of hours, but their furniture had to go down to Baltimore and Philadelphia before coming up the Schuylkill Canal. Consequently it was six months on the way, according to tradition. It may have been held up by floods or ice; no one is now alive to say.

Robert Carlisle of Pottsville (79 years old in 1943) ran off to the canal as a little boy. This was against his father's wish, but, since the deed was done, the elder Carlisle went to his captain, Pete Reilly of Cressona, and said "Give this boy all the canal he wants".

Evidently the Captain took the parent at his word, as a later event will show.

The young Robert "drove stations" first at Schuylkill Haven and later at Port Carbon. He remembers taking cargoes of limestone to the furnaces on "the Island" at Pottsville, and occasionally they took down a load of pig-iron from there rather than the usual coal.

He went with loads of coal as far as Troy and even Cahoes in New York, and to Washington D. C. where it was unloaded from the canal at Georgetown.

Old men on the canal told him of how the mine cars came down from Guinea Hill, in Pottsville, on wooden rails. The coal was then loaded at Rook and Evns mill, just about the corner of East Norwegian and Railroad Streets, where the William Penn Hotel now stands.

He remembers some tough treatment on his first boat, though he gave no particulars. Once, when a line fouled he was told "Go and pull

that line out of the chalk". When it suddenly became taut it thru the youngster three feet up in the air.

At any rate his early treatment must have rankled, for when newly grown and feeling his young manhood pretty cockily, he met his old captain, he said, "Peter square yourself. If it's possible I'm going to lick you". When he had knocked the Captain down once he said, "Get up, you dirty skunk, you", which seems to have ended it.

After 1885 and after the Reading Railroad took over the Schuylkill Navigation Company, it still paid the lock-tenders and such employees of the canal as were kept on the pay rolls.

This was done by means of a little steam tug called the Dolphin, but which--from its narrow and peculiar construction--the elder Schaeffer called the hog-trough.

Its hull was so narrow that the deck had to be widened, so that it came out from the edge of the boat in a sort of overhang. Consequently the crew was walking about above the water rather than over the body of the boat. Its draught was about four feet, which accounts for its being able to navigate the upper reaches of the canal where the large boats could no longer go.

Its boiler was as wide as the boat was, lacking a few inches, and there was only a little room behind it, below-decks, for coal. It stopped for coaling at locks or anywhere along its route. The boiler for this boat had once served the little railroad observation car kept for the Reading officials' use and known as the Witch. There were two others--the Black Diamond and the Ariel.

The Dolphin itself had once been the proud 90 foot iron hull Havre de Gras, but the two ends had been cut off her to rid her of the faulty middle part, and she became a stumpy little boat--much to the disgust of the old boatman who liked a ship-shape craft. After the bow and stern had been joined it well earned its name of the Dolphin.

When not travelling up and down the canal with the baymaster or on some other errand this small boat now only 65 feet long, lay in the Basin at Reading.

George Schaeffer says the Schuylkill Rangers had their hangout at Port Richmond then North of Philadelphia on the Delaware. *

He said they were a mean and vindictive lot. If they fell out with other boatmen over real or fancied grievances, they would stop at nothing to get even.

They would call out a rival boatman from his Schuylkill Haven home, pretending to want a friendly talk, then beat the man up so he was not fit to take out his boat the next day or, in some cases, for many days. One man was beaten so seriously that he was bedfast for a month.

A Port Carbon member of the Rangers got a grudge against a boatman named Crawley. When the latter started for his boat to get some pipe tobacco, the Port Carbon man said "I'll give you a pipe of tobacco", and went below to fill it. A bystander was suspicious and shook his head at Crawley to warn him not to light the pipe. Crawley took the warning, and when they examined the pipe together, later, they found powder and a cap, to be ignited by it, which would have blown the man's head off.

* See Hesser article in this vol. Part II, p. 13.

When the Schuylkill Haven docks were abandoned Bert Geiger, who had been a sort of dockmaster, there asked Zulick, the head of the Canal Company at "the Haven", if he thought Geiger could get one of the boats to take out, and get his living that way. Zulick got him a boat.

Now, the Rangers had Geiger down in their black books for two reasons:

A boat with a good load for New Haven, Conn. once was filled at one shute while the Ranger's boat had to wait for the shute just beyond. At the time, they claimed Geiger had favored another boatman with a good paying load instead of them.

Now, they were angry because he got first chance at this boat, to work out of PortClinton and over into New York Harbor.

Geiger was warned, "They're goin' to lay fer you, and do you dirty", and it wasn't long in coming. Two of them on an adjoining boat threw a loop of rope over Geiger, and would have pulled him into the canal, if he hadn't been on his guard.

When Geiger felt the rope tighten about him, he hooked his foot into the rail and as the rope drew taut whipped out his pocket knife and cut the line in two. "You were trying to put me out", he yelled. "Now go up to the office and get the money coming to you, for you won't be running boats on this canal".

Not only were the Rangers jealous of their rights, but they would "raise Cain" in Zulick's office if they thought other boatmen were getting better paying loads. They finally got so bold with their plotting and spying that they had a spotter who entered the dock office to steal the list of boats and cargoes. They then became so abusive and unruly that someone came up from the Philadelphia office and had about 20 of them arrested.

The Rangers were angry at George Schaeffer's father, David Schaeffer, because he got the new boat Duke, which the company later bought from Schaeffer.

Zulick told David Schaeffer that unless Schaeffer could load 200 tons "Schuylkill Draft" on this boat they wouldn't take the boat. Schaeffer got 204 tons 15 hundred weight on her, and his own private stock of coal for his cook stove on top of the dead hatch, in addtion. The Company then bought the boat and made him captain, for 197 or 198 tons were the usual loads.

One of the Rangers tried to pay off his grudge when Schaeffer was passing Fairmount Park one morning, with the Ranger's boat coming up behind him, "Lay over against the bank till we get by", yelled the Ranger. Schaeffer drew over by the berm bank to let him pass, just as the two boats were opposite, the Ranger poised a harpoon-like pike pole ready to throw. Schaeffer's wife saw what was coming and yelled to her husband, who dropped down on the deck just in time. The pole passed over him, but had been thrown with such murderous force that it would have gone completely through his body. As it was, it struck a tree on the bank and stuck there quivering.

A Park guard, upon the hill, had witnessed the whole performance, and came running down. "Captain, tie up your boat, come to the City Hall with me and press charges against this man", he said and placed the man under arrest. When Schaeffer demurred, the Guard said, "This is a madman, he's not safe to be at large". Before the judge Schaeffer said, "I don't like to do this, the man has a family who will suffer." The judge said it was too bad the man didn't think of his family, and gave him a prison term of 15 years for intent to kill.

George Schaeffer, who later was a railroad man and a tugboat captain in New York for the Moran's, until 1918, recalled one Johnny Raber of (Schuylkill Haven ?) who used to "drive team" on the Canal. Later he became a Methodist minister and when the ~~order~~ of Junior Order of American Mechanics asked him to preach a sermon for them, he said, "Yes", I'll preach a sermon for the Junior Mechanics". He did, and this is the way that sermon started, "Whoa mule, I'm the driver"!

PENN STREET, Port Clinton, Pa. 1

Abandoned boats on the Sch[illegible]

BUSY DAYS ON CANAL ARE OVER

The damage done by culm settling into the Schuylkill cannot be fully appreciated until one becomes familair with the conditions that exist and contrasts them with the canal activities of a few years ago. Along the canal in the lower part of the city there remains what was once the shipyard of John A. Hiester. Years ago this yard built nearly all the boats that carried coal and other commodities to market and much of the repairing was handled at this place.

Now the only thing that one can see is desolation and ruin; canal boats are half sunk in the water and an old steamboat that was used for river traffic is slowly going to ruin from the culm that is allowed to enter the river by the coal operations in the Schuylkill region.

The First Steamboat

Frank Hiester, who lives at 431 South Sixth street, a son of the late John A. Hiester, tells the following interesting story: "In 1869 my father brought the first steamboat to Reading. He was a boatbuilder and constructed many that were used in river traffic and carried thousands of people annually between Reading, Tulpehocken, High Woods, Flying Hill and Klappertha1. I have been working around here for 45 years, and see what culm has done to this canal and the river."

Mr. Hiester walked to the old basin, and there lying about are seven canalboats, half sunk in the bed, rotting away. Where there was a busy industry there is nothing now but waste.

"WE built," he said, "the Golden Eagle, the Rosie, the Iona, the Atlantic and the

I. W. Ringler, and out there lying on her side, is the Rosie. I remember when 1,350 canalboats were on the canal, and I can recall the days when we carried hundreds of passengers up and down this old stream. But now there is nothing, and Why? Because they allow people to dump the mine waste into the stream, and this is what happens."

Recalls Other Days

John Bare, who lives at 116 Hamilton street, and who is now retired, gave some interesting data on the old canal. He said: "I Worked on this canal for about 62 years, and I can recall when the waterway was a busy hive of industry. There are no boats running now because of the condition of the canal. Things are changed around here, but I like to come down and sort of look things over. I used to boat from here to Lock Haven, and we carried a lot of coal in those days. There are no boats going down the canal

bedause they cannot get through on account of the culm."

To see the conditions around Jackson 's Locks, with the old boats half sunk in the water, and to walk over the island and meet those old boatmen, who contributed so much to transportation, brings to mind very forcibly this one thought--that something should be done to improve the river bed so that an industry that meant so much to Reading and vicinity can be revived.

Not a boat will go down the canal from Hamburg to Philadelphia this year. None made the trip last year, and it is more than likely that carrying coal by water from the mines is a thing of the past.

In addition to the trouble with culm there is another factor that plays an important part. There was a time, years ago, when the canal was not owned by the Reading Railway Co. The two were in competition for

freight. The canal passing into the hands of the railroad, it appears, was the beginning of the end of the waterway as a coal carrier.

Evidently from the Reading Eagle. Taken from an old scrapbook of unknown origin. SEp